

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.





LIBRARY
RECEIVED

GENERAL INDEX

JUL 6 1931

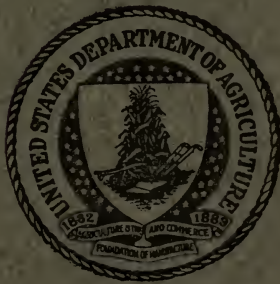
TO

U. S. Department of Agriculture

EXPERIMENT STATION RECORD

VOLUMES 41 TO 50, 1919-1924

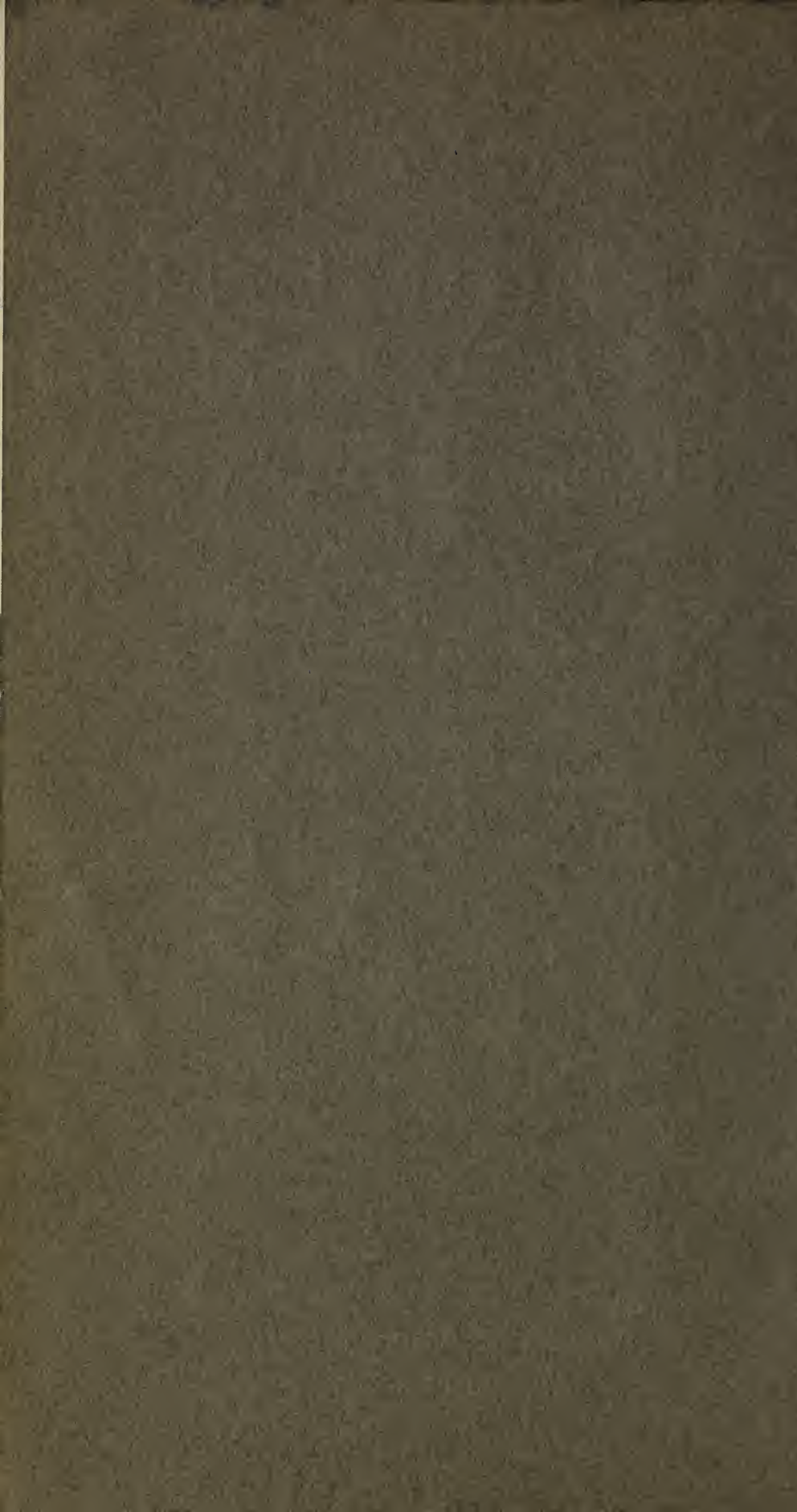
PREPARED BY
MARTHA C. GUNDLACH



UNITED STATES DEPARTMENT OF AGRICULTURE

OFFICE OF EXPERIMENT STATIONS

1931



1
UNITED STATES DEPARTMENT OF AGRICULTURE
OFFICE OF EXPERIMENT STATIONS
W. H. EVANS, ACTING CHIEF
/

GENERAL INDEX
TO
EXPERIMENT
STATION
RECORD

VOLUMES 41 TO 50, 1919-1924

PREPARED BY
MARTHA C. GUNDLACH



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1931

EXPERIMENT STATION RECORD

Editor: HOWARD LAWTON KNIGHT

EDITORIAL DEPARTMENTS

Agricultural and Biological Chemistry—H. C. WATERMAN, SYBIL L. SMITH.
Meteorology—W. H. BEAL.
Soils and Fertilizers—H. C. WATERMAN.
Agricultural Botany and Diseases of Plants—W. H. EVANS, W. E. BOYD.
Genetics—H. M. STEECE, J. W. WELLINGTON, G. HAINES.
Field Crops—H. M. STEECE.
Horticulture and Forestry—J. W. WELLINGTON.
Economic Zoology and Entomology—W. A. HOOKER.
Animal Husbandry, Dairying, and Dairy Farming—H. W. MARSTON.
Veterinary Medicine—W. A. HOOKER.
Agricultural Engineering—R. W. TRULLINGER.
Rural Economics and Sociology, Agricultural and Home Economics Education—F. G. HARDEN.
Foods and Human Nutrition—SYBIL L. SMITH.
Textiles and Clothing—H. M. STEECE, SYBIL L. SMITH.
Home Management and Equipment—
Indexes—MARTHA C. GUNDLACH.
Bibliographies—CORA L. FELDKAMP.

THE AGRICULTURAL EXPERIMENT STATIONS

ALABAMA—*Auburn*: M. J. Funchess.¹

ALASKA—*Sitka*: H. W. Alberts.¹

ARIZONA—*Tucson*: E. D. Ball.¹

ARKANSAS—*Fayetteville*: D. T. Gray.¹

CALIFORNIA—*Berkeley*: C. B. Hutchison.¹

COLORADO—*Fort Collins*: C. P. Gillette.¹

CONNECTICUT—

State Station: *New Haven*; } W. L. Slate.¹
Storrs Station: *Storrs*; }

DELAWARE—*Newark*: C. A. McCue.¹

FLORIDA—*Gainesville*: W. Newell.¹

GEORGIA—

Experiment: H. P. Stuckey.¹

Tifton: Coastal Plain Station; S. H. Starr.¹

GUAM—*Island of Guam*: C. W. Edwards.¹

HAWAII—

Federal Station: *Honolulu*; J. M. Westgate.¹

Pineapple Cannery Station: *Honolulu*; R. N. Chapman.¹

Sugar Planters' Station: *Honolulu*; H. P. Agee.¹

IDAHO—*Moscow*: E. J. Iddings.¹

ILLINOIS—*Urbana*: H. W. Mumford.¹

INDIANA—*La Fayette*: J. H. Skinner.¹

IOWA—*Ames*: C. F. Curtiss.¹

KANSAS—*Manhattan*: L. E. Call.¹

KENTUCKY—*Lexington*: T. P. Cooper.¹

LOUISIANA—*Baton Rouge*: C. T. Dowell.¹

MAINE—*Orono*: W. J. Morse.¹

MARYLAND—*College Park*: H. J. Patterson.¹

MASSACHUSETTS—*Amherst*: F. J. Sievers.¹

MICHIGAN—*East Lansing*: V. R. Gardner.¹

MINNESOTA—*University Farm, St. Paul*: W. C. Coffey.¹

MISSISSIPPI—*A. and M. College*: W. R. Perkins.¹

MISSOURI—

College Station: *Columbia*; F. B. Mumford.¹

Fruit Station: *Mountain Grove*; F. W. Faurot.¹

Poultry Station: *Mountain Grove*; T. W. Noland.¹

MONTANA—*Bozeman*: F. B. Linfield.¹

NEBRASKA—*Lincoln*: W. W. Burr.¹

NEVADA—*Reno*: S. B. Doten.¹

NEW HAMPSHIRE—*Durham*: J. C. Kendall.¹

NEW JERSEY—*New Brunswick*: J. G. Lipman.¹

NEW MEXICO—*State College*: Fabian Garcia.¹

NEW YORK—

State Station: *Geneva*; U. P. Hedrick.¹

Cornell Station: *Ithaca*; A. R. Mann.¹

NORTH CAROLINA—*State College Station, Raleigh*: R. Y. Winters.¹

NORTH DAKOTA—*State College Station, Fargo*: P. F. Trowbridge.¹

OHIO—*Wooster*: C. G. Williams.¹

OKLAHOMA—*Stillwater*: C. P. Blackwell.¹

OREGON—*Corvallis*: J. T. Jardine.¹

PENNSYLVANIA—

State College: *R. L. Watts*.¹

State College: Institute of Animal Nutrition; E. B. Forbes.¹

PORTO RICO—

Federal Station: *Mayaguez*: T. B. McClelland.¹

Insular Station: *Rio Piedras*: R. Fernández García.¹

RHODE ISLAND—*Kingston*: B. E. Gilbert.¹

SOUTH CAROLINA—*Clemson College*: H. W. Barre.¹

SOUTH DAKOTA—*Brookings*: J. W. Wilson.¹

TENNESSEE—*Knoxville*: C. A. Mooers.¹

TEXAS—*College Station*: A. B. Conner.¹

UTAH—*Logan*: P. V. Cardon.¹

VERMONT—*Burlington*: J. L. Hills.¹

VIRGINIA—

Blacksburg: A. W. Drinkard, jr.¹

Norfolk: Truck Station; T. C. Johnson.¹

VIRGIN ISLANDS—*St. Croix*: J. R. Ricks.¹

WASHINGTON—

College Station: *Pullman*; E. C. Johnson.¹

Western Station: *Puyallup*; J. W. Kalkus.²

WEST VIRGINIA—*Morgantown*: F. D. Fromme.¹

WISCONSIN—*Madison*: H. L. Russell.¹

WYOMING—*Laramie*: J. A. Hill.¹

¹ Director.

² Superintendent.

EDITORIAL NOTES

VOLUME 41

| | Page |
|---|------|
| The agricultural appropriation act, 1919-20..... | 1 |
| Agricultural education in the American Expeditionary Forces..... | 101 |
| Economy in experiment station work..... | 301 |
| The beginnings of agricultural research in California..... | 401 |
| The thirty-third annual convention of the Association of American Agricultural Colleges and Experiment Stations..... | 601 |
| The human factors in agriculture..... | 701 |
| Research aspects of rural economics and social science..... | 705 |

VOLUME 42

| | |
|---|-----|
| Memorial exercises for Dr. C. G. Hopkins..... | 1 |
| Changes in the <i>Record</i> | 4 |
| Back numbers available for distribution..... | 5 |
| The need of better illustrative material relating to research..... | 101 |
| Governmental support for the Woburn Experimental Fruit Farm..... | 104 |
| Pasture experiments in Great Britain..... | 106 |
| Conference of Southern Agricultural Workers..... | 301 |
| The organization of investigation in agriculture..... | 304 |
| The border line between extension and experimentation in agriculture..... | 401 |
| Extension specialists in agriculture and home economics..... | 601 |
| Two notable congresses on agricultural reconstruction in France and Belgium..... | 701 |

VOLUME 43

| | |
|---|-----|
| The experiment stations and their funds..... | 1 |
| The price of delay..... | 5 |
| The agricultural appropriation act, 1920-21..... | 101 |
| Some essentials of the research project..... | 301 |
| First convention of Canadian Society of Technical Agriculturists..... | 401 |
| The classification of abstracts in the <i>Record</i> | 404 |
| James Wilson, late Secretary of Agriculture..... | 601 |
| The thirty-fourth annual convention of the Association of Land-grant Colleges..... | 701 |

VOLUME 44

| | |
|---|-----|
| A catalogue of experiment station work..... | 1 |
| Bibliography on nutritive value of corn and corn products..... | 4 |
| Respiration chamber for experiments with large animals at the New Hampshire Station..... | 5 |
| The Chicago meeting of the American Association..... | 101 |
| Agriculture in the American Association..... | 102 |
| The man power of the experiment stations..... | 301 |
| The agricultural appropriation act, 1921-22..... | 401 |
| The identity of the experiment station..... | 601 |
| College organization in relation to the station force..... | 701 |
| Genius in research..... | 705 |

VOLUME 45

| | |
|---|-----|
| Semicentennial of Massachusetts Agricultural College..... | 1 |
| The 1921 Commencement of the University of Tennessee..... | 7 |
| Research in agricultural engineering..... | 101 |
| Changes in station administration..... | 301 |

| | Page |
|---|------|
| The retirement of two notable figures----- | 304 |
| Private contributions for agricultural education and research of the last decade----- | 401 |
| Graduate courses for workers in the U. S. Department of Agriculture-- | 407 |
| The passing of Dr. Henry Prentiss Armsby----- | 601 |
| The thirty-fifth convention of the Association of Land-grant Colleges---- | 701 |

VOLUME 46

| | |
|---|-----|
| Agriculture at the Toronto meeting of the American Association----- | 1 |
| Research from the standpoint of the problem and the locality----- | 101 |
| Common interest in the progress of specialized inquiry----- | 105 |
| Agricultural research at the National Agricultural Conference----- | 301 |
| The claim of duplication----- | 401 |
| The evidence of projects and publications----- | 404 |
| Duplication v. conventionalism----- | 406 |
| Home economics at the experiment stations----- | 601 |
| An agricultural conference at the University of Illinois----- | 701 |

VOLUME 47

| | |
|---|-----|
| The agricultural appropriation act, 1922-23----- | 1 |
| Popularizing agricultural investigation----- | 101 |
| The 1920 report on the work and expenditures of the stations----- | 301 |
| The 1921 list of station projects----- | 305 |
| A check list of station publications on plant pathology----- | 307 |
| Reminiscences of Rothamsted----- | 401 |
| Importance of a long-time program----- | 601 |
| Nature and scope of future plans----- | 603 |
| The thirty-sixth convention of the Association of Land-grant Colleges-- | 701 |

VOLUME 48

| | |
|---|-----|
| The experiment station worker and his work----- | 1 |
| Growing interest in cooperative inquiry----- | 5 |
| The function of administration in research----- | 101 |
| The agricultural appropriation act, 1923-24----- | 301 |
| Pasteur: An inspiration for agricultural research----- | 401 |
| The experiment stations and range utilization----- | 601 |
| Progress in agricultural research in Great Britain under the Development Act----- | 701 |

VOLUME 49

| | |
|---|-----|
| Changes in leadership----- | 1 |
| Progress in experiment station research in horticulture----- | 101 |
| A California view of agricultural college education----- | 301 |
| Some recent developments in forestry research----- | 401 |
| The World's Dairy Congress----- | 601 |
| The thirty-seventh convention of the Association of Land-grant Colleges-- | 701 |

VOLUME 50

| | |
|--|-----|
| Bequest of Hatch farm for agricultural experimentation----- | 1 |
| Final report of the director of the States Relations Service----- | 3 |
| President W. M. Riggs, deceased----- | 5 |
| Change in editorial management of the <i>Record</i> ----- | 5 |
| Establishment of a section of genetics----- | 6 |
| The status of experiment station research in rural economics----- | 101 |
| Federal aid to agricultural research in Great Britain, Canada, and France since the war----- | 301 |
| The stage of diminishing returns----- | 401 |
| Essentials in maintaining the volume of research product----- | 405 |
| A National Temple of Science----- | 601 |
| A biography of Senator Morrill----- | 603 |
| The Office of Experiment Stations as viewed from without----- | 606 |
| Experimental work with cotton in the British Empire----- | 701 |

SUBJECT INDEX

NOTE.—The numbers inclosed in parentheses refer to volume numbers, the others to pages. The station publications are indicated by an abbreviation of the station immediately before the page number, except where all the references are from the same station, in which case the abbreviation precedes the volume number.

"A. & M. Berry," new hybrid, (46) Tex. 335.

Aaronsohn, A., biographical sketch, (41) 400.

Abaca—

culture and uses, (43) 826.

disease, (50) 549.

distribution, relation to soil and climate, (47) 809.

fiber, deterioration, (50) 434.

grading, baling, and inspection, (50) 434.

heart and root rot, (46) 43.

obtaining fiber from, (45) 39.

papers on, (50) 638.

properties and uses, (50) 534.

studies, (48) 833.

varieties, fiber yield, (50) 829.

waste as paper-making material, (41) 732.

weevil, notes, (45) 551.

Abbella subflava, parasitism by, (44) 654.

Abbotana clemataria, notes, (41) 354.

Abderhalden test, specificity, (41) 84.

Abortion—*see also* *Bacillus abortus and*

Bacterium abortum.

agglutination test for, (45) 685; (49) 586.

and diseases of foals, (49) 481.

and Malta fever, causative organisms, relation, (50) 183.

and sterility, (43) 780; (48) Mich. 396.

artificial immunity, (50) Minn. 181.

bacilli in blood of calves from infected milk, (49) 681.

bacilli in milk of infected cows, (50) 480.

bacilli infection of bovine uterus, sequelae of, (42) 878.

bacteria associated with, (49) Ky. 581.

bibliography, (41) 192.

bleeding for tests of, (44) Mich. 578.

bovine, name for, paper on, (42) 877.

bovine, susceptibility of swine to, (49) Mich. 884.

bull as carrier, (42) Mich. 397.

cause, (42) 677, 878; (49) Colo. 476. Kans. 478.

control, (42) 878, 881; (43) 181.

diagnosis, (42) 677; (48) 678; (50)

West. Wash. 584.

diseases causing, (50) 78.

Abortion—Continued.

effect on milk production, (50) Ky. 874.

epizootic, of cattle, (45) 583; (50) 582.

epizootic, summary, (45) 179.

experimental, in a cow, (49) 380.

herd immunity to, (45) 886.

immunization, (44) 879; (45) Wis.

285, Okla. 478, 784; (46) 483, 776;

(47) Wis. 482, 486, 786, 787; (48)

880; (49) 881.

in cattle, (42) 676, 878; (43) Conn.

Storrs 584, 683; (44) 183, 480,

578; (45) 73, 180, 886; (46) Mo.

377, 483, 683, 773; (47) Conn. Storrs

386, 387, Ark. 787; (48) West.

Wash. 298, Calif. 578; (49) Conn.

Storrs 784, 785.

in cattle—

and mares, (47) Minn. 383.

and swine, (48) Mo. 674.

and swine, relationship, (47) 880.

control, (49) Mo. 79, 179, Mich.

478.

papers on, (48) 277; (49) Calif.

79.

summary, (48) Oreg. 380.

transmission, (45) Mich. 482.

in domestic animals, (49) 477.

in donkey and pony mares, (46) 685.

in farm livestock, summary, (50)

Nebr. 79.

in goats, (43) Mich. 688.

in horses, (46) 685.

in horses in U. S. Army, control, (48) 381.

in Ireland, outbreak, (48) 678.

in mares, (41) 873; (44) Minn. 180,

Minn. 778; (45) 179, 585; (46)

Ky. 885; (48) 882; (49) Ky. 272,

Ky. 273, 283.

in mares, causal organism, (41) 684;

(48) 882.

in mares, occurrence in Great Britain,

(46) 178.

in sheep, (42) 273, 570; (46) Mich.

484.

in swine, (43) 585, 586; (44) 184,

482; (45) 77, 781; (46) Mo. 378,

884; (47) Wis. 482, Calif. 684, Ark.

787; (48) Wis. 282, Calif. 578;

(49) Ill. 380, Ill. 787.

Abortion—Continued.

- in swine and cattle, relationship, (47) 880.
- in swine, etiology and control, (47) 186.
- lecture on, (42) 674.
- methods of spread, (49) Oreg. 582.
- new vaccine, (41) 474; (42) 878; (43) 82.
- notes, (41) 777, 873.
- paper on, (42) 877; (45) 679; (47) 280, 283.
- paratyphoid, in mares, (42) 273, 568.
- prevention, summary, (50) 480.
- relation to human health, (47), 85.
- review of literature, (43) 784.
- role of udder and secretion in, (48) 380.
- so-called, possible cause, (42) 777.
- studies, (41) 85, 191, 779, 780; (43) Mo. 784; (44) Mich. 578, Oreg. 874, Mich. 878, Mich. 879; (45) 583; (50) Vt. 381.
- summary, (41) 479, Mich. 479, 578; (43) 82; (48) Wyo. 180.
- susceptibility of swine to, (46) Mich. 582.
- tests for, (41) Mo. 683; (50) 879.
- treatment with collargol, (46) 277.
- Abscission in Juglans, (41) 134.
- Absidia ramosa rastl, notes, (49) 381.
- Absorption and agglutination tests, correlation, (43) 879.
- Absorptive power of soils, effect of pulverization and settlement, (49) 512.
- Abutilon theophrasti, variation in, (43) 433.
- Acacia—
 - arabica, seed treatment, (47) 241.
 - beans and pods, analyses, (45) 775.
 - koa, description and uses, (42) 739.
 - villosa, suitable for planting with teak, (47) 241.
- Acacias—
 - in Australia, (49) 440.
 - of Western Australia, (41) 744.
 - tropical of Queensland, (42) 840.
- Acanthocephala—
 - from the Illinois River, (41) 464.
 - of domestic animals, classification, (44) 375.
- Acanthopsyche—
 - junodi, natural enemies, (46) 247.
 - spp., notes, (42) 361.
- Acanthorynchus vaccinii on cranberries, (45) U.S.D.A. 54.
- Acarapis woodi—
 - and Isle of Wight disease, (46) 464, U.S.D.A. 858; (47) 557.
 - in Switzerland, (50) 762.
 - notes, (47) 558; (48) 355.
 - transformations, (47) 857.
- Acari, nonparasitic, of Tyroglyphidae, (44) 851.

Acarids—

- of stored grain and flour, (41) 463; (42) 551.
- studies, (43) 80.
- Acarina, occurrence and distribution, (46) 752.
- Acarine disease—
 - cause, (47) 551.
 - distribution, (50) U.S.D.A. 158.
 - in Switzerland, (50) 762.
 - notes, (41) 463; (43) 57; (46) 464, 857, 858, U.S.D.A. 858; (47) 558; (48) 355.
 - protection against introduction into America, (49) 357.
 - relation to Nosema apis and Acarapis woodi, (47) 557.
- Acarophenax tribolii, notes, (41) 463.
- Accipitres, synoptical list, (43) 250.
- Accounting, farm, see Farm accounting.
- Acephalina species, lists, (48) 462.
- Acerentulus barberi n.sp., notes, (46) 255.
- Acerin, isolation and analyses, (46) N.Y.State 308.
- Acetaldehyde—
 - effect on catalase production, (42) 708.
 - effect on protein hydrolysis, (43) 110.
 - exhalation from ripe apples, (43) 711.
 - formation from sugar, (45) 611.
 - fungicidal and germicidal value, (48) Can. 144.
 - production, (44) 610.
- Acetanilid, effect on catalase production, (42) 259.
- Acetic acid—
 - analysis, (46) 114.
 - determination, (41) 112.
 - effect on molds, (45) 463.
 - effect on swine, (42) 266.
 - glacial, as solvent for vitamin B, (48) 12.
 - production from alkali-sawdust fusion, (41) 314.
 - production from corncobs, (45) 510.
 - toxic action for white mice, (50) 569.
- Acetic index for detection of butter adulteration, (48) 13; (49) 311.
- Aceto-arsenite of copper, new preparation, (47) 758.
- Acetone—
 - and paradichlorobenzene, insecticidal value, (48) Ky. 357.
 - concentration in blood, studies, (43) 205.
 - determination in urine, (45) 316.
 - from corncobs, (46) 208.
 - from fermentation of corn, (50) 12.
 - from oat and peanut hulls, (48) 713.
 - manufacture, bacteriology of, (46) 617.
 - production, (41) 414, 415, 508; (42) 708; (43) 712; (44) 710.
 - solvent properties, (50) 201.
 - use in composite engine fuels, (49) 888.
- Acetone-butyl alcohol fermentation of carbohydrates, (43) 502.

Acetonuria in domestic mammals, (43) 879.
 Acetyl values, determination, (47) 311;
 (50) 11.
 Acetylsalicylic acid, antipyretic action, (43)
 371.
 Achatina fulica, control, (44) 751.
 Achatodes zeae, notes, (45) 759.
 Achorion schoenleinii, notes, (47) 678.
 Achorutes viaticus on sewage filters, (42)
 188; (43) 853.
 Achras n.spp., descriptions, (41) 653.
 Achromaticus macfieii, notes, (43) 883.
 Achrysocharis camilli, notes, (45) 459.
 Achrysophagus spp., notes, (45) 459.
 Acid—
 application to garden soil, effect on
 propagation, (49) 836.
 carbonate salts, buffer action, (49) 814.
 feeding, effect on pigs, (49) Iowa 772.
 fish, effect on soil acidity, (47) R.I.
 519.
 number determination of crude fat,
 (42) 111.
 number determinations, (47) 202.
 organic, formation in leaves, (44) 825.
 phosphate, *see* Superphosphate.
 produced by Sterigmatocystis nigra,
 (50) 328.
 production by bacteria, detection, (46)
 N.Y.State 431.
 rations, effect on pigs, (46) Iowa 363.
 solutions, taste of, relation between
 total acidity and H-ion concentra-
 tion, (43) 11.
 stools of breast-fed or bottle-fed in-
 fants, cause, (47) 463.
 Acid-fast organisms, action of oils on, (46)
 579.
 Acidia—
 heraclei, life history and control, (48)
 157.
 n.spp., description, (42) 653.
 Acidimetry—
 electrometric, with platinum wire,
 (48) 709.
 of colored solutions, (42) 612.
 of soils, (43) 12, 612, 713.
 Acidity—
 determination, H-electrode, (43) 313.
 in cream, partial neutralization, (43)
 75.
 in muck soils, (50) N.C. 320.
 ion exchange, in mineral soils, (50)
 514.
 method of stating, (41) 205.
 of culture media, (43) 329.
 of ice cream, effect, (50) 281.
 of the air, studies, (44) 209.
 rôle in sugar inversion, (43) 416.
 soil, *see* Soil acidity and Soils, acid.
 specific, of foliage of African sorrel,
 (49) 713.
 Acidosis—
 and creatinuria, (42) 367.
 and rickets, (42) 367.
 diagnosis, (41) 364.
 treatise, (41) 281.

Acids—

amino, *see* Amino acids.
 and bases, organic, estimation, (44)
 411.
 and bases, titration, (46) 413.
 and minerals, equilibrium studies, (47)
 213.
 bacterial tolerance to, (46) N.C. 740.
 determination in silage, (49) 205, 206.
 effect on—
 carbon-dioxid-combining power of
 blood plasma, (47) 64.
 catalase production, (44) 63.
 clay, (47) 722.
 germination, (47) 627.
 heat production, (47) 63.
 swine, (42) 266.
 fatty, *see* Fatty acids.
 formation from neutral salts in contact
 with colloids, (41) 364.
 from oat and peanut hulls, (48) 713.
 in fruit juices and foods, determination,
 (49) 805.
 in soils, alkaline reaction, (46) 320.
 in storage apples, (50) 542.
 in wheat varieties, (47) 222.
 new indicator for, (41) 112.
 organic and inorganic—
 adsorption by activated sugar char-
 coal, (49) 506.
 effect on soil solubility, (41) Mich.
 513.
 titration method, (49) 803.
 organic—
 formation by Aspergillus niger,
 (46) 225.
 in preserved fruits, (49) 112.
 variation during anthocyanin for-
 mation, (46) 723.
 produced by Rhizopus tritici on sweet
 potato, (50) 21.
 rôle in jelly formation, (49) Del. 9.
 separation from mixed solutions, (41)
 112.
 titration, (48) 313.
 toxicity for mosquito larvae, (50) 357.
 volatile—
 fatty, production, (45) 311.
 produced by starters, Iowa (49)
 781; (50) 109.
 production by Streptococci in
 starters, (46) Iowa 76.
 production from corncocks, (46)
 208.
 Acne bacillus and Nocard's bacillus, com-
 parison, (48) 879.
 Aconite—
 poisonous to livestock, (45) Wyo. 479.
 poisonous to livestock, control, (42)
 879.
 Aconitum columbianum, chemical examina-
 tion, (45) 410; (49) Wyo. 476.
 Acorn—
 hulls, composition, (42) Tex. 369.
 kernels, composition, (42) Tex. 369.
 weevil, control, (47) Ohio 359.

Acorns—

- analyses, (42) 562.
- as food for poultry, (42) 562.
- feeding value, (42) Tex. 369, 769.

Acrididae in British Columbia, life history, (45) 454.

Acridin compounds, antiseptic potency, (42) 272.

Acridium peregrinum, *see* Locusts, migratory.

Acriflavin—

- antiseptic value, (41) 188; (43) 79.
- emulsion, antiseptic value, (41) 83.

Acrobasis caryaevorella, spraying experiments, (45) 256.

Acrocercops sp. on cotton, (42) 648.

Acroclisoides luzonensis, parasitism by, (45) 663.

Acrodynia, relation to pellagra, (46) 261.

Acrolein, new test for, (48) 711.

Acrolepia assectella, notes, (42) 152.

Acronycta oblonga, notes, (43) Conn.State 251.

Acrospeira mirabilis and Spirospora castaneae, identity, (47) 541.

Acrostalagmus—

- caulophagus, notes, (50) 354.
- vilmorinii thomensis, notes, (49) 540.

Acrothecium—

- penniseti n.sp., notes, (48) 47.
- spp., notes, (46) 742

Actinometers, standardization, (46) 418.

Actinomyces—

- activity in soils, (49) 515.
- as affected by green manure, (48) 120.
- chromogenus—

- control, (49) Va.Truck 348
- notes, (43) 243, 655; (45) 650; (49) 843; (50) 550.
- on potato, (42) Hawaii 543.
- on sugar beets, (46) 450.

in milk, effect, (48) 275.

scabies—

- control, (45) Iowa 648; (47) N.J. 150.
- notes, (43) 751; (44) Wash. 542; (46) 847; (47) 248, S.Dak. 448, Wis. 841; (48) 348, 349; (49) 46.
- studies, (46) 450; (48) Can. 47.
- sp., notes (44) 447.
- spp., culture and key, (42) 434.
- taxonomic position, (41) 430.

Actinomycetales—

- classification, (44) 517.
- subgroups and genera, (41) 821.

Actinomycetes—

- culture media for studying, (46) N.Y.State 317.
- effect of soil reaction on growth, (48) 212.
- effect on reaction of culture media, (43) 635.
- in soil, method of demonstrating, (48) 421,

Actinomycetes—Continued.

- metabolism, studies, (42) 434; (45) 338.
- morphology and biology, (49) 30.
- nitrogen metabolism, (43) 634, 635.
- proteolytic enzymes, (41) 822.
- soil, nutrition, (45) 726.
- studies, (41) 217.

Actinomycosis—

- bovine, causal organisms, (49) 380.
- bovine, pathogenesis and treatment, (48) 677.
- pulmonary, in swine, (46) 777.
- summary, (45) Mo. 685.

Actinonema rosae—

- life history, (41) 658.
- notes, (44) 750.

Aculeata, parasitic, studies, (42) 159.

Acysta perseae, notes, (43) 851; (47) U.S.D.A. 157.

Adelphocoris rapidus—

- affecting beans, (44) 549.
- notes, (41) Fla. 548; (47) N.Y.Cornell 848.

Adhesive for Bordeaux mixture, (44) Hawaii 48.

Adhesives—

- manufacture from corncobs, (43) 809.
- preparation from waste sulphite liquor, (42) 615.

Adina cordifolia, description and distribution, (47) 43.

Adlay—

- as food crop, (45) 737.
- culture directions, (45) 35.
- food characteristics, (49) 56.
- food value and uses, (47) 163.
- merits and possibilities, (48) 630.
- milling tests, (50) 829.
- review of literature, (47) 164.

Adoretus—

- tenuimaculatus on cacao leaves, (43) 52.
- versutus, notes, (43) 52; (48) 254.

Adrenal—

- bodies, changes due to inanition, (45) 667.
- capsules, hypertrophy, (44) 669.
- glands, effect of scorbutic diet on, (42) 464.
- glands, function, relation to H-ion concentration, (49) 561.
- glands, ratio of cortex and medulla in rats, (42) 665.
- insufficiency cause of edema, (43) 66.

Adrenalin—

- action on turtle heart, (44) 374.
- effect on carbohydrate metabolism, (42) 557.
- effect on catalase production, (42) 258, 259.
- effect on deficiency disease in pigeons, (49) 769.
- effect on milk secretion, (48) 265.

Adrenalin—Continued.

- equilibrium, effects of vitamin deficiency, (50) 668.
- in suprarenals of albino rats, (42) 665.

Adrenals—

- as effected by diet deficiency, (45) 265, 368.
- function as affected by thyroids, (44) 669.
- pigments of, (45) 64.
- sheep's, antirachitic properties, (50) 771.

Adsorption—

- at liquid-vapor and liquid-liquid interfaces, (47) Kans. 407.
- by activated sugar charcoal, (49) 505.
- by soil colloids, (46) 810; (49) 17.
- in soils, (48) 618; (49) 16.
- of plant nutrients, (49) 17; (50) 16.

Adult illiterates, education of, (48) 599.

Advertising and farm market, papers on, (49) 190.

Advitant, use of term, (42) 164.

Adzuko beans, *see* Beans.

Aecidiaceae of Guatemala, (41) 135.

Aecidium—

- fraxini, notes, (44) Conn.State 149.
- grossulariae, studies, (42) Conn.State 247.
- schweinfurthii, notes, (47) 541.
- spp., notes, (46) 845.

Aecophoridae, synonymical note, (45) 361.

Aedes—*see also* Mosquitoes, *Stegomyia*, and Yellow fever mosquito.

- aegypti, notes, (46) P.R. 157. 661; (48) 751; (49) 657.
- calopus larvae, control by fish, (48) 751.
- calopus larvae, time of exposure to kerosene, (49) 853.
- calopus, notes, (45) V.I. 150.
- solicitans in fresh water polluted by acid, (45) 555.
- spp., behavior, relation to atmospheric conditions, (50) 757.
- spp., chemotropism, (47) N.J. 553.

Aegeria—*see also* Sesia.

- exitiosa, *see* Peach borer.
- opalescens, control, (47) 360.
- pyri, studies, (44) U.S.D.A. 162.
- tipuliformis, *see* Currant borer.

Aeginetia indica—

- life history and control, (50) 248.
- notes, (46) 45.

Aenoplegimorpha phytonomi, synonymy, (46) 857.

Aenoplex polychrosidis n.sp., description, (42) 655.

Aeolothripidae—

- life history and habits, (48) 457.
- notes, (44) 653.

Aeolothrips auricestus n.sp., notes, (41) 755.

Aeration—

- apparatus for ammonia determination, (43) 212.
- effect on *Azotobacter*, (49) 213.

Aeration—Continued.

- effect on plants, (48) 828.
- effect on roots of *Zea mays*, (43) 327.
- effect on vitamins, (45) 565.
- relation to development of soy beans, (48) N.J. 328.

Aerial—

- forest surveys, (47) 41.
- photographs, interpretation of, (43) 748.
- sounding, highest, (44) U.S.D.A. 716.

Aerological—

- apparatus, new, (43) U.S.D.A. 718.
- investigations, kites and balloons for, (50) U.S.D.A. 314.
- observations, U.S.D.A. (42) 14; (43) 118.
- observations in West Indies, (43) U.S.D.A. 718.
- survey of United States, (48) U.S.D.A. 15.
- work in United States Navy, (42) U.S.D.A. 620.

Aeronautics, weather factor in, (44) U.S.D.A. 717.

Aesculus pavia killed by *Botrytis cinerea*, (41) 453.Afforestation, *see* Forestation.

African coast fever, (43) 582.

Agalaxy, contagious, of sheep and goat, (46) 377.

Agallia sanguinolenta, notes, (45) Mich. 251.

Agamermis decaudata n.g. and n.sp., studies, (49) 357.

Agamoflaria tabanicola, notes, (50) 359.

Agar—

- gel, gross structure, (47) 327.
- hydration as affected by acids and amido compounds, (41) 221.
- powder, preparation, (41) 614.
- swelling in solutions of amino acids, (45) 337.
- zinc content, (41) 464.

Agaricaceae, effect of light on fructification, (43) 819.

Agars, A.P.H.A. and milk powder, comparison, (48) 672.

Agave—

- cantula as paper-making material, (41) 732.
- determination of flexibility, (46) 230.
- disease, (48) 846.
- weevil, notes, (42) 751; (46) 58.

Agaves—

- fiber elements, (50) 434.
- fiber, poling in, (47) 33.
- history of, (41) 242.
- monograph, (41) 827.
- varieties, (50) 29.

Agelastica alni, biology, (41) 59.

Agglutination—

- and absorption tests, correlation, (43) 879.
- as colloidal phenomenon, (41) 111.
- studies, (43) 781.

Agglutination—Continued.

- studies of *Clostridium* spp., (49) 881.
- technique of, (45) 279.
- test for abortion, (42) 677; (45) 685; (49) 586; (50) West.Wash. 584.
- test for glanders, (44) 779.
- test for recurrent ophthalmia, (42) 678.
- tests, antiserum for, (41) 875.
- tests on sera prepared with *Bacillus sporogenes*, (49) 880.

Agglutinins—

- effect of, studies, (41) 377.
- in calves' blood, relation to globulins of colostrum, (48) 180.
- in milk, source, (49) 280.
- production as affected by deficient nutrition, (41) 574.
- production, effect of vitamin deficiency, (49) 279.

Aggregates, road, *see* Road materials.

Agonoscelis rutilia, notes, (41) 551, 661.

Agrarian—

- agitations in Italy, (44) 591, 890.
- crusade, treatise, (48) 792.
- development of France and Germany, (48) 392.
- legislation, new, in central Europe, (48) 493.
- movement in United States, (46) 91.
- problem in Hungary, (49) 894.
- reform in Czechoslovakia, (46) 92; (50) 91, 594.
- reform in Esthonia, (50) 393.
- reform in Roumania, (43) 94.
- revolution in United States, (44) 387.
- systems in Europe, history, (48) 894.

Agricultural—

- aid in Scotland, (45) 895.
- almanac, 1921, (45) U.S.D.A. 198.
- analysis, quantitative, manual, (49) 407.
- and Veterinary College in Brazil, (48) 200.
- associations in Porto Rico, (43) 291.
- associations in Switzerland, statutes of, (50) 393.
- bacteriology, textbook, (49) 819.
- bank of South Africa, report, (47) 894.
- bargaining, collective, (43) 488.
- bloc, treatise, (48) 391.
- botany, textbook, (44) 194.
- business management, (49) 89.
- by-products as feeding stuffs, (43) 170.
- charts of eastern cotton States, (48) 893.
- chemistry, *see* Chemistry.
- club efficiency, standards, (45) 94.
- club, treatise, (47) 394.
- clubs, junior, clothing project, (46) 697.
- clubs, junior, manual, (47) 598.
- college—
 - curriculum, (50) 495.
 - determining aims of courses, (49) 596.

Agricultural—Continued.

- college—continued.
 - education, California view, (49) 301.
 - for West Indies, (44) 696.
 - instruction, papers on, (50) 895.
 - problem of research in, (49) 596.
 - Southeastern, in England, (46) 791.
 - teachers and teaching, papers on, (49) 596.
- colleges—
 - and Department of Agriculture, cooperation, (43) 704.
 - Canadian, entrance requirements and courses, (46) 194.
 - curricula, (46) 789; (49) 492.
 - curricula building, interpreting local practices in, (49) 493.
 - dairy departments in, (44) 794.
 - economic and social sciences in, (41) 701.
 - extension activities, (49) 796.
 - functions, symposium, (42) 690.
 - improvement of instruction, (42) 393.
 - in Great Britain, new buildings for, (50) 800.
 - institutional ethics, (41) 604.
 - laws concerning, U.S.D.A. (42) 496; (49) 195.
 - need for sociology in, (44) 689.
 - organization, effect on station force, (44) 701.
 - organization list, U.S.D.A. (41) 197; (49) 492.
 - place in State development program, (41) 603.
 - present problems, (43) 703.
 - statistics, (41) 296; (44) 389.
 - study of, (41) 389.
- colonies and tenancy copartnership societies in Burma, (49) 389.
- colonization—*see also* Colonization and Land settlement.
 - by soldiers in British Empire, (41) 592.
 - in Albania, (41) 792.
 - in Algeria, (41) 893.
 - in Germany, (41) 293.
 - in Japanese Sakhalin, (42) 393.
 - in Palestine, (41) 891; (42) 594.
 - studies, (41) 891.
- colony at Woodbine, New Jersey, (47) 495.
- commerce department of Chicago University, (46) 800.
- Commission, French, to Nigeria, (46) 798.
- commodities, prices, index to sources, (49) U.S.D.A. 794.
- competition and demand, (48) U.S.D.A. 890.
- conditions—
 - at Yuma Reclamation Farm, (48) U.S.D.A. 297.

Agricultural—Continued.

conditions—continued.

- in Algeria, (48) 492.
- in Belgian Kongo, (45) 395.
- in Cleves, (45) 894.
- in Deccan Canal areas, (43) 95.
- in France, (44) 891.
- in French Alps, (49) 390.
- in Great Britain, (42) 190.
- in Greece, (43) 600.
- in Guam, (45) Guam 88.
- in India, (43) 293; (47) 295, 796.
- in Kalamazoo Co., (49) Mich. 898.
- in Morocco, (49) 595.
- in Ozark Highland, (43) 894.
- in Russia, (42) 894; (49) 693.
- in Saskatchewan, (49) 894.
- in South Africa, (42) 896.
- in southern Minnesota, (41) 212.
- in southern United States, (42) 490.
- in Union of South Africa, (47) 894.
- in United States, (47) 296.
- in United States, address, U.S.D.A. (42) 286, 287.
- on Belle Fourche project in 1918, (42) U.S.D.A. 392.
- conference in Illinois, editorial, (46) 701.
- Convention, National, in China, (48) 398.
- cooperation, (44) 90, 191, 197, Kans. 386, 593.
- cooperation—
 - causes of failure, (43) 192.
 - essentials, (44) 691.
 - for small producers, (42) 89.
 - fundamentals, (44) Calif. 292.
 - in America, (41) 388, 593.
 - in Argentina, (44) 692; (50) 92.
 - in Bavaria, (42) 690.
 - in Belgium, (42) 89, 791; (46) 292; (49) 895.
 - in Burma, (43) 94.
 - in Canada, (41) 293, 695.
 - in Czechoslovakia, (47) 597.
 - in Denmark, (43) 292, 694; (46) 292; (49) 190; (50) 296.
 - in Egypt, (41) 94.
 - in England and Wales, (43) 895; (48) 893.
 - in France, (41) 293, 593, 793.
 - in Germany, (42) 687.
 - in Great Britain, (42) 89.
 - in India, (42) 594, 790, 791; (43) 192, 293, 488; (45) 594, 693; (46) 895; (47) 298; (48) 597; (49) 191; (50) 192, 795, 894.
 - in India, treatise, (49) 93.
 - in Ireland, (46) 91.
 - in Italy, (41) 491; (43) 94; (50) 93.
 - in Japan, (47) 95.
 - in Minnesota, (42) Minn. 391.
 - in Nebraska, (43) 594.

Agricultural—Continued.

cooperation—continued.

- in New South Wales, (47) 95.
- in Ontario, (42) 289.
- in Philippines, (41) 793; (43) 294.
- in Prague, (50) 894.
- in Punjab, (41) 94; (48) 691.
- in Roumania, (43) 94; (46) 895.
- in Russia, (42) 89, 791.
- in Russia, revival, (49) 191.
- in Scotland, (43) 895.
- in South Africa, (41) 293; (42) 89.
- in southern highlands, (50) 296.
- in Switzerland, (42) 594; (46) 390.
- in Tropics, (42) 599.
- in Yugoslavia, (46) 495.
- laws of New York, (42) N.Y. Cornell 442.
- reading list, (50) U.S.D.A. 92.
- treatise, (41) 592; (43) 594; (45) 897.
- cooperative—
 - associations, statistics, (49) Minn. 490.
 - movement, treatise, (49) 391.
 - societies in Germany, (42) 392.
 - societies in India, (47) 597.
 - societies in Porto Rico, (47) 597.
 - societies in Sweden, (49) 894.
 - syndicates in France, (49) 894.
- Council in Denmark, (43) 600; (50) 533.
- credit—
 - and cooperation in Tropics, (42) 599.
 - association, organization, (46) U.S.D.A. 388.
 - conditions, (47) 295.
 - cooperative, (41) 592, 593.
 - cooperative, in Manitoba, (41) 491.
 - during the war, (44) 488.
 - farm loans, types, (43) 192.
 - Federal Farm Loan System, (41) 94, 293; (43) 394.
 - function of central banks, (43) 294.
 - hearings on Senate bills, (48) 788.
 - in France, (41) 388, 793; (46) 592.
 - in France, methods, adaptation to Scotland, (44) 488.
 - in Germany, (42) 687.
 - in Great Britain, (49) 891.
 - in Illinois, (43) 593.
 - in India, (43) 293, 294.
 - in Iowa, (46) 94.
 - in Italy, (50) 593.
 - in North Carolina, (50) 391.
 - in Ontario, (46) 493.
 - in Philippines, (41) 793; (43) 294; (45) 693.
 - in Porto Rico, (46) 592.

Agricultural—Continued.

credit—continued.

- in South Africa, (42) 88.
- in Spain, (42) 490.
- in United States, (41) 293; (42) 689; (47) 692; (50) 291, 490.
- in Utah, (50) 291.
- in Wisconsin, (41) 193.
- institutions in Germany, (48) 390.
- institutions in United States, (43) 393.
- intermediate, (50) U.S.D.A. 291.
- legislation, (50) 690.
- mortgage system, (50) 91.
- need in cattle industry, (42) 290.
- needs for and conditions, (48) 389.
- needs of settlers, (44) Wis. 289.
- relation to Federal Reserve System, (44) 197.
- short-time, (43) 294; (48) 188; U.S.D.A. 890.
- societies, (47) 93.
- societies in India, (47) 95.
- system, creating, (50) 91.
- system for United States, treatise, (48) 891.
- system of rating, (42) 87.
- tabulation of bank loans, (46) 592.
- to small farmers in Prussia, (44) 591.
- Credits Act in England, (50) 793.
- Credits Act of 1923, (49) 292; (50) 391, 793.
- crisis, causes, (50) 489.
- department of a country bank, treatise, (49) 295.
- development—
 - cooperative relations in, (44) U.S.D.A. 297.
 - fund in Great Britain, (41) 94.
 - in Denmark, (42) 895.
 - in French colonies, (45) 596.
 - in India, (48) 392; (49) 295.
 - need for in New England, (43) 123.
 - need, in Punjab, (48) 94.
- digest, King's, 1923, (50) 93.
- ecology, (47) U.S.D.A. 413.
- ecology in Italy, new service, (48) 314.
- economics, *see* Rural economics.
- education, (49) 597.
- education—*see also* Agricultural instruction.
 - and research in China and Japan, (49) 596.
 - and research in Czechoslovakia, (49) 596.
 - conference, (45) 295.
 - curriculum construction, (50) 897.
 - elementary, in Canada, (42) 692.
 - elementary, in New Brunswick, (43) 796; (47) 298.
 - for farmers, (47) 97.
 - fundamentals, (49) 392.

Agricultural—Continued.

education—continued.

- higher and secondary in Netherlands, (42) 91.
- home projects, (42) 594.
- in Algeria, (42) 494; (47) 495; (48) 192; (49) 796.
- in America and Victoria, (41) 296.
- in Argentina, (42) 294; (43) 296; (46) 897.
- in Australia, (45) 598; (46) 696.
- in Belgian Congo, (46) 392.
- in Belgium, (46) 94.
- in Belgium, improvement, (44) 694.
- in Belgium, reorganization, (43) 295; (45) 597; (47) 194, 798.
- in Brazil, (50) 399.
- in California, beginnings of, (41) 401.
- in Canada, (44) 599, 696, 899; (46) 599; (47) 499; (48) 899; (49) 100.
- in Canada, development, (45) 192.
- in Canada, report, (42) 596.
- in Chile, (41) 696; (43) 96.
- in China, (42) 399, 799.
- in Denmark, (46) 295; (49) 897.
- in Dutch East Indies, (43) 795.
- in England, (43) 487; (46) 897.
- in England and Wales, (43) 493; (49) 393.
- in Europe, (44) 390.
- in Federated Malay States, (47) 598.
- in France, (44) 500, 695; (46) 497.
- in France, laws and decrees, (48) 794.
- in France, reorganization, (43) 95.
- in Germany, reorganization, (46) 897.
- in Great Britain, (41) 390, 796, 893, 895; (42) 697; (44) 599; (47) 896; (48) 794.
- in India, (41) 795; (42) 90; (45) 495; (49) 194.
- in Ireland, (50) 694.
- in Japan, (42) 90.
- in Kansas, (42) 295.
- in Latin America, (42) 199, 798.
- in New South Wales, (41) 595; (43) 96.
- in Norway, (44) 695; (49) 896; (50) 93.
- in Ontario, (50) 596.
- in Poland, (48) 96.
- in Portugal, needs, (42) 493.
- in Quebec, (45) 495.
- in St. Lucia, (47) 298.
- in Scotland, (41) 797; (43) 896; (44) 390; (46) 597; (48) 192.
- in secondary schools, (45) 494.
- in Sweden, (44) 695.

Agricultural—Continued.

education—continued.

- in the Orient, (45) 100.
- in Union of South Africa, (46) 597; (47) 598.
- in United States, (47) 494; (48) U.S.D.A. 895.
- in Victoria, (44) 896.
- in Virginia, (44) 296.
- in West Indies, (46) 194.
- interesting the farmer in, (45) 398.
- 1916-1918, review, (41) 295.
- of Rhodesian natives, (47) 194.
- private contributions, editorial, (45) 401.
- professional, for farm children in Belgium, (49) 95.
- project method, (43) 492; (49) 194.
- public professional, (49) 598.
- regulations for grants in England and Wales, (43) 195.
- relation to farm organization, (49) U.S.D.A. 392.
- relation to Federal Government, (49) 7.
- report, (50) 93.
- significance of type activities, (42) 192.
- treatise, (50) 897.
- value, (46) 896.

education, vocational—

- and agricultural extension, relationships, (48) 394.
- at Camp Devens, (44) 399.
- by home projects, (41) 395.
- courses, (42) 195.
- curriculum building, (48) 598.
- deriving courses of study in, (50) 394.
- equipping school plant, (43) 695; (49) 95.
- evening school work in, (50) 297.
- farm shop work in, (44) 297.
- Federal Board for, report, (48) 692.
- field trips for, (43) 97.
- for colored students, (49) 194.
- for disabled service men, (46) 193.
- for farmers, (48) 896.
- gains and tendencies, (48) 394.
- home projects in, (44) 297, 898.
- in Arkansas, (42) 192.
- in California, (42) 294.
- in high schools, (44) 92; (47) 495.
- in Idaho, (43) 298, 493.
- in Illinois, (43) 695.
- in Indiana, (44) 794.
- in Mississippi, (42) 596.
- in Missouri, (41) 395.
- in New Jersey, (43) 796; (44) 696.
- in New York State, (48) 794.
- in Ohio, (44) 697.
- in secondary schools, (49) 895.

Agricultural—Continued.

educational, vocational—continued.

- in South Carolina, (43) 597; (44) 794.
 - in Tennessee, (44) 295.
 - in Texas, (50) 297.
 - in Veterans Bureau Schools, (46) 399.
 - in Virginia, (43) 597.
 - in West Virginia, (44) 493.
 - junior projects in, (46) 897.
 - maintenance, (44) 595.
 - paper on, (48) 196.
 - record forms, (44) 493.
 - relation to nonvocational education, (50) 297.
 - rooms for, (42) 495.
 - score card method of rating, (50) 694.
 - secondary, in Virginia, (42) 495.
 - statistics, (44) 793.
 - stimulating interest in, (48) 96.
 - summer teaching in, (45) 195.
 - supervision, (42) 595.
 - teacher relation to community, (48) 896.
 - teacher training for, (41) 298.
 - teaching, job analysis in, (50) 693.
 - teaching methods, (46) 393.
 - tendencies, (50) 94.
 - time emphasis in, (43) 492.
 - treatise, (49) 493.
 - under Federal Board, (47) 396.
 - unit and short courses, (41) 395.
 - encouragement in France, (41) 200.
- engineering—
- courses, (50) 100.
 - extension work in, (42) 94; (48) 197.
 - guide, (42) 274.
 - in Bombay, (43) 185.
 - papers on, (50) 100.
 - research in, (44) 199; (46) 98; (48) 199; (50) 100.
 - research in, editorial, (45) 101.
 - students, psychological tests for, (48) 197.
 - studies, (44) Calif. 786; (48) Calif. 590; (49) Iowa 788.
 - technical efficiency test, (44) 199.
- entomology of Brazil, (47) 253.
- estates, taxation, (50) 192.
- experiment stations, *see* Experiment stations.
- experimentation, application of probable error, (49) 596.
- experiments, design and interpretation, (48) 128.
- experiments in Utah, (45) Utah 698.
- export industry of Argentina, (46) 292.
- exports, activities of Bureau of Markets, (42) 287.
- extension, (43) Ind. 395.
- extension—
- achievements, (49) 195.
 - among negroes, (46) U.S.D.A. 297.

Agricultural—Continued.
extension—continued.

and experimentation, boundaries, editorial, (42) 401.
and vocational education, relation, (42) 595; (48) 394.
charts for visual instruction in, (48) 497.
clubs, junior, organization, (49) 297.
cooperative, U.S.D.A. (42) 396; (44) 495, 792; (46) 597; (47) 496; (48) 692.
county farm bureau development, (42) U.S.D.A. 289.
demonstration work, treatise, (46) 296.
educational tours, (44) 495.
farm management teaching, (41) 895.
in California, (42) Calif. 897; (45) 696.
in Canada, (46) 194.
in Chinese missions, (42) 399.
in engineering, (48) 197.
in Florida, (46) 95.
in Guam, Guam (46) 793; (49) 494.
in Manitoba, (43) 297.
in Massachusetts, (43) 194; (45) 696.
in New Jersey, N.J. (41) 95; (42) 897.
in North and West, (42) U.S.D.A. 396.
in Scotland, (41) 797.
in South, (42) 594.
in South Carolina, (45) 696.
in Southern States, U.S.D.A., (42) 396; (48) 497.
in Spain, (41) 793; (50) 599.
in United States, (41) U.S.D.A. 197; (42) 897; (44) 93.
in Wisconsin, (41) Wis. 95.
junior, (43) 396, 695; (48) 895; (49) 96.
junior, community plan, (49) 297.
method of measuring, (49) 596.
needs and maintenance, (46) 792.
on Indian reservations, (43) 799.
organization, editorial, (44) 609.
papers on, (50) 896.
plans of United States Department of Agriculture, (49) 491.
program, building, (49) 492.
program, determining, function of research departments, (49) 596.
program in rural social organization, (49) 492.
publications, (49) Mich. 495.
relation to farm bureau movement, (43) 706.
relation to legislation, (44) 494.
rise and significance, (48) 692.
service in economics, (49) 492.
specialist, field of, (49) 596.

Agricultural—Continued.
extension—continued.

specialists, function, editorial, (42) 601.
State, organization, (44) 898.
teaching, (45) U.S.D.A. 799.
teaching for adults, (48) 599.
teaching, State policy in, (50) 897.
war service of county agent, (42) U.S.D.A. 299.
workers, education for, (49) 492.
workers, records for, (44) U.S.D.A. 195.
workers, training, (49) 596.
facts and figures, notebook, (49) 193.
fair at Kansas College, notes, (45) 95.
fair exhibits, West.Wash. (43) 798; (49) 898.
fairs in Canada, (41) 495, 895.
fairs, organization and activities, (45) 398.
forecasts, paper on, (50) 198, 595.
geography, (44) 384; (48) U.S.D.A. 890.
geography, effect of freight rates, (48) 689.
geological maps, (48) 615.
Holdings Act, provisions, (50) 792.
Holdings Acts of Great Britain, (45) 895.
Holdings Acts, treatise, (48) 594.
holdings, distribution in India, (43) 292.
holdings in France, consolidation, (49) 189.
hydraulics in Cochin China, (43) 689.
hydraulics, treatise, (42) 274.
implement industry, effect of agricultural depression, (47) 296.
implements, (47) 391.
implements, new, for India, (42) 283.
implements, normal day's work, (43) U.S.D.A. 193.
improvement, papers on, (50) 896.
income, course from 1897 to 1922, (49) 290.
index for farmers, (46) 89.
industries, development in France, (45) 720.
industry in Queensland, organization, (50) 390.
inquiry in Congress, (50) 488.
institute—
at University of Breslau, (49) 796.
in Algeria, (49) 796.
in Shantung, (50) 499.
in West Africa, (42) 200.
Ultuna, report, (42) 394.
institutes in England and Wales, (44) 492.
institutions and associations in Denmark, directory, (41) 494.
institutions, changes in leadership, (49) 1.

Agricultural—Continued.

instruction—*see also* Agricultural education.

- Act in Canada, report, (45) 196; (49) 896.
- annual plan of work, (44) 596.
- at University of Philippines, (44) 895.
- course for high school, (41) 196.
- course in Vermont, (50) 496.
- course of study, (44) 596.
- courses, (41) 395, 396; (43) 196, 696, 697; (45) 92; (50) 395.
- development in secondary schools, (44) 595.
- effect of Smith-Hughes law, (44) 193.
- elementary, (42) 298, 495.
- elementary—
 - farm projects in, (47) 696.
 - in Los Angeles, (43) 795.
 - in Montana, (43) 598.
 - in Nova Scotia, (45) 495.
 - in Texas, (43) 598.
 - in Wisconsin, (43) 797.
- for Argentina, (47) 495.
- for disabled in France, (42) 493.
- for farmers, (50) West.Wash. 195.
- for farmers' daughters, (44) 698.
- for farmers in Germany, (42) 898.
- for officers in Great Britain, (41) 696.
- for rural and city schools, (44) 295.
- for service men, (41) 95, 200, 596, 797; (42) 198, 500, 698; (43) 395; (44) 390.
- function and organization of course of study, (43) 897.
- handling laboratory work in, (50) 597.
- home project method, (45) 495.
- illustrative material for, (43) 396.
- importance, (48) 794.
- improvement in agricultural colleges, (42) 393.
- in American Expeditionary Forces, (41) 101, 603.
- in Belgium, (43) 897.
- in Brazil, (43) 97, 396.
- in British Columbia, (48) 395.
- in Canada, (41) 195, 296, 696, 895, 896; (47) 397.
- in China, (47) 695.
- in colleges, (44) 894.
- in colleges, improvement, (43) 705.
- in Colorado, (43) 396.
- in continuation schools, (44) 493.
- in Cuba, (49) 696.
- in Dominica, (47) 495.
- in Dutch East Indies, (43) 296; (47) 695.
- in France, (41) 796; (42) 396, 495.

Agricultural—Continued.

instruction—continued.

- in Germany, (43) 897.
- in high schools, (41) 697.
- in high schools, credits for, (43) 298.
- in Illinois, (43) 695.
- in Iowa, winter short term, (48) 598.
- in Ireland, (41) 493; (44) 695, (47) 597; (50) 394.
- in Mexico, (45) 398.
- in Netherlands, (41) 390.
- in New Hampshire, (44) 897.
- in Mexico, (41) 396.
- in New Zealand, (49) 95.
- in Norway, (41) 391; (42) 91.
- in Ontario, (45) 196; (46) 696.
- in reformatory and industrial schools, (41) 596.
- in rural schools, (45) 495.
- in St. Lucia, (47) 298.
- in secondary schools in Maine, (43) 96.
- in Spain, (46) 392.
- in Spanish rural schools, (47) 200.
- in Sweden, (41) 391.
- in United States, (47) 597.
- in West China Union University, (47) 200.
- in Wisconsin, (44) 294.
- job lesson units, (50) 898.
- laboratory exercises for, (42) 195.
- lessons, (43) 797.
- organization of county system, (48) 190.
- papers on, (42) 793.
- part-time and evening classes, (44) 391.
- part-time cooperative courses, (48) 296.
- part-time work in, (48) 191.
- philosophy, (45) 196.
- planning the course with the farmer, (49) 797.
- preapprenticeship and apprenticeship in Africa, (43) 295.
- project method, (46) 193.
- relation of general science to, (42) 291.
- school farm in, (46) 94.
- schoolhouse and shops for, (43) 598.
- secondary, (42) 195, 196.
- secondary, science in, (42) 691.
- short courses and extension schools, (45) 495.
- short courses in, (48) 598.
- Smith-Hughes method, (46) 597.
- standardizing, in Germany, (44) 194.
- supervised practice in, manual, (42) 195.
- use of community resources, (47) 299.

Agricultural—Continued.

instruction—continued.

- use of farms and farmers in, (48) 896.
- winter short course for high schools, (48) 191.
- insurance, hail and livestock, (44) 593.
- insurance in Philippines, (43) 294.
- Intelligence Station at Montpellier, report, (45) 443.
- investigation, organization and coordination, editorial, (42) 304.
- investigation, popularization, editorial, (47) 101.

journals—

- as effected by the war, (41) 604.
- new, (42) 200, 500, 700; (43) 499; (45) 100; (46) 600, 800; (48) 799, 899; (49) 400, 499; (50) 499, 500.

rôle in education, (48) 792.

union check list, (41) 400.

labor—see also Labor.

- and equipment, cost data, (49) N.Y.Cornell 691.
- and wages in Norway and Sweden, (47) 894.
- bureaus in France, (41) 491.
- by women, (41) 293.
- by women in England and Wales, (42) 895; (44) 789.
- conditions for, (43) 193.
- conditions in Europe, (50) 291.
- conditions in South Africa, (45) 493.
- conditions, studies, (42) Wis. 391.
- contract breaking, prosecution, (45) 895.
- contract piece wage, (44) 291.
- economic position in Great Britain, (41) 193, 194.
- efficiency in India, (43) 293.
- hours and wages in England, (42) 190.
- in Austria after the war, (45) 492.
- in early nineteenth century, (46) 494.
- in England, (49) 189.
- in England, history, (44) 291.
- in Esthonia, (48) 492.
- in Finland, (50) 892.
- in France, (42) 287, 288, 490; (50) 392.
- in France, treatise, (50) 292.
- in Germany, (41) 490, 592; (42) 687; (45) 395.
- in Great Britain, treatises, (41) 93.
- in Japan, (46) 390, 494.
- in Louisiana, (45) U.S.D.A. 693.
- in Scandinavia, (50) 392.
- in Scotland, (42) 190; (46) 91; (50) 292.
- in Scotland as affected by education act, (41) 493.

Agricultural—Continued.

labor—continued.

- in Sweden, (44) 488; (46) 693.
- in wheat belt, (47) U.S.D.A. 182.
- in Wisconsin, (44) Wis. 89.
- international relations, (45) 193.
- law in Germany, (45) 594.
- minimum wage rates, (47) 395.
- minimum wages in England and Wales, (42) 491.
- minimum wages in Scotland, (45) 896.
- organization on a farm, (48) 595.
- outlook for 1919, (41) 889.
- problem, (44) 196; (45) 88.
- profit sharing and copartnership in, (42) 190.
- regulation, (45) 192.
- requirement in Ohio, (49) 189.
- returns, choice of crops based on, (45) 85.
- review, (45) 492.
- seasonal requirements on French farm, (48) 491.
- shortage, causes, (47) Minn. 797.
- statistics of Belgium, (43) 292.
- status in Belgium, (47) 693.
- supply and business, (50) 392.
- supply, maintenance during the war, (49) 692.
- survey, (44) Kans. 288.
- treatise, (49) 191.
- unions in Great Britain, (44) 692.
- utilization, Mo. (45) 292; (46) 387; (48) 686.
- v. school attendance, (44) 892.
- wages, (41) 388, 890; (42) 491, U.S.D.A. 492; (44) 387; (46) 593; (50) 793.

labor wages—

- analysis, (47) Minn. 796.
- Board, history, (46) 389.
- Board, work of, (44) 90.
- factors affecting, (43) 793.
- fall in, (48) 596.
- in Bessarabia, (43) U.S.D.A. 694.
- in Denmark, (48) 596.
- in Great Britain, (41) 388, 890; (45) 594.
- in India, (41) 389.
- in Ireland, (41) 388.
- in Italy, (45) 896.
- in Norway, (45) 896.
- in Posen, (45) 896.
- methods of calculating, (47) 295.
- payment, development, (49) 692.
- relation to prices, (44) 89, 592.

laborers—

- housing, (41) 488, U.S.D.A. 692; (42) 593.
- in United States, (48) 891.
- normal day's work, (43) U.S.D.A. 193.
- selective service deferments, (41) 793.

land, see Farm land and Land.

Agricultural—Continued.

- landowner and duties, (48) 389.
- law in England, (45) 895.
- law, recent, in Great Britain, (44) 90.
- laws in—
 - France, (43) 292.
 - Maine, (42) 88.
 - Massachusetts, (46) 694.
 - Nebraska, (42) 390.
 - New York, (42) 291.
- laws, new tendencies, in Italy, (41) 191.
- lease contracts in Prussia, regulations for protection, (47) 691.
- legislation, (48) U.S.D.A. 890.
- legislation, international yearbook, (42) 390; (45) 293; (46) 292; (48) 792; (50) 393.
- limits of population in United States, (47) 596.
- machinery—*see also* Harvesting and Threshing.
 - analysis of belt speeds, (47) 688.
 - and implements, (47) 190; (49) 85.
 - and its operation, treatise, (50) 588.
 - and its use, treatise, (41) 487.
 - basis for use in Rhine Province, (48) 685.
 - blue book, (45) 392.
 - care and operation, (42) 893.
 - cooperative use in Germany, (47) 394.
 - costs and accomplishment, (45) 392.
 - courses of instruction in, (44) 393.
 - depreciation, calculating, (48) 687.
 - descriptions, (41) 419.
 - design, field experience as factor, (48) 197.
 - development in England, (43) 483.
 - draft investigations, (47) Nebr. 792.
 - draft tests, (42) 184.
 - dynamometer tests, (42) 892.
 - equalizers and hitches, (42) 186.
 - export packing, (46) 383.
 - for cultivation of silage crops, (43) 289.
 - for harvesting oats, (48) 186.
 - for motor tillage, selection, (42) 588.
 - for thinning and harvesting root crops, (49) 86.
 - foreign markets for, (43) 289.
 - fuller utilization of, (42) 83.
 - gear teeth, repair, (44) 484.
 - grinding wheels, selection and use, (44) 287.
 - high-speed rotating, balancing, (49) 485.
 - importance, (44) 200.
 - in Germany, (50) 388.
 - lubrication, (44) 586.

Agricultural—Continued.

- machinery—continued.
 - manufacture and distribution in Minnesota, (45) 83.
 - manufacture and sale, (47) U.S. D.A. 190.
 - motor-driven, air filters for, (48) 684.
 - overhauling, (48) 896.
 - prices, relation to farm organization, (45) 396.
 - repair, post drill press for, (43) 483.
 - repair with twist drills, (45) 186.
 - report, (45) 83.
 - resistance to wear of parts, (42) 587.
 - selection and cost, (43) 790.
 - standardization, (42) 83.
 - studies, (47) Iowa 792.
 - tests, (42) 587; (49) 486; (50) 687.
 - treatise, (50) 189.
 - use in Brazil, (43) 90.
 - uses of ball and roller bearings, (49) 589.
- materials, micro-nitrogen determination in, (47) 310.
- mechanics section of French institute, (46) 889.
- meteorology—
 - field of investigation, (49) 807.
 - international organization, (44) 499.
 - present status, (46) 208.
- mills, cooperative, (49) 94.
- missions, conference on, (48) 899.
- nature study, course of instruction in, (49) Calif. 195.
- officials, institutions and organizations, list, (44) 295.
- opportunities for ex-service men, (41) 296, 392.
- organization—
 - advantages, (42) 895.
 - earliest, in India, (43) 292.
 - in Great Britain, (41) 695.
 - in India, (41) 490, 491.
 - in Ireland, (41) 491; (43) 488; (45) 897.
 - in New York State, (42) 190.
 - in South, (42) 594.
 - in United States, treatise, (50) 590.
 - Society, report, (47) 394; (49) 93.
- organizations—
 - American, directory, (44) U.S.D.A. 384.
 - in Ohio, (44) Ohio 489.
 - in Spain, (41) 591.
 - relation to agricultural colleges, (50) 896.
 - teaching cooperation through, (48) 896.
- output, controlling, (49) 89.

Agricultural—Continued.

- policy for Great Britain, (46) 784.
- policy, trend in New York, (42) 286.
- population, *see* Population and Rural population.
- possibilities in Pahang, Federated Malay States, (49) 895.
- possibilities in Philippines, (46) 91.
- practice and economics, bases of, in India, (45) 291.
- problem in Great Britain, tribunal for investigation, (48) 200.
- problems—
 - and the rural church, (48) 190.
 - Congressional action, (46) 595.
 - in Hungary, (50) 193.
- production—
 - and native products from Africa, (50) 596.
 - as affected by depreciation of exchange, (43) 489
 - as affected by research, (45) 84.
 - assistance by industrial councils, (42) 288.
 - cooperation in, (50) 92.
 - cost and distribution, (48) U.S.D.A. 890.
 - cost in relation to price, (45) Tex. 85.
 - in Algeria, (50) 793.
 - in Brazil, survey, (43) 488.
 - increasing in Australia, (44) 591.
 - mobility in, (45) 85.
 - natural laws of, (44) 590.
 - organization for, (48) U.S.D.A. 890.
 - relation to population, (43) 693.
 - world, position of Czechoslovakia in, (47) 395.
- products—
 - and cost accounting, (41) 192.
 - changes in prices, (47) 395.
 - chemical composition, (41) 501.
 - cost data, (42) Mich. 397.
 - cost of production, (45) Mo. 292; (46) 590, Miss. 590, N.J. 590; (48) N.J. 387, Mo. 686; (50) Can. 591, Can. 592.
 - cost of production, method of study, (46) U.S.D.A. 291.
 - effect of foreign exchange on, (42) 894.
 - export trade of Philippines, (43) 487.
 - exports to Cuba, (50) 693.
 - exports to Europe, (50) 596.
 - Federal inspection, (43) U.S.D.A. 490.
 - foreign demand for, (42) 287.
 - foreign trade in, (43) U.S.D.A. 595.
 - Franco-Polish commerce in, (50) 794.
 - freight rates in France, (46) 694.
 - grading in New Hampshire, (42) 289.
 - in Germany, protective tariff for, (42) 592.

Agricultural—Continued.

- products—continued.
 - inspection, (42) U.S.D.A. 191.
 - minimum price system, (42) 391.
 - national marketing program, (45) 395.
 - of Brazil, (43) 291.
 - of France, foreign trade, (49) 296.
 - of French Africa, (42) 230.
 - of French East Africa, (44) 594.
 - of Friesian farms, (47) 894.
 - of Idaho, standardization, (47) 393, 492.
 - of international importance, (49) 94.
 - prices, (44) 197, 387; (45) 695; (46) U.S.D.A. 192; (47) Minn. 797; (48) U.S.D.A. 890; (50) Minn. 193, Ohio 294, Ohio 594.
- prices—
 - and present situation, (47) 296.
 - and railway rates, (48) 689.
 - and wages in India, (41) 389; (45) 295.
 - balance of and cost of production, (42) 592.
 - during the war, (42) 191.
 - effects in Germany, (44) 690.
 - factors affecting, (50) Nebr. 594.
 - fall of, causes and effects, (48) 492.
 - farmers' influence on, (49) 91.
 - fixing, (43) 489.
 - fixing by Government control of surplus, (49) 489.
 - future, (43) 193.
 - Government control, (43) 394.
 - in Canada, (42) 191.
 - in France, (42) 490, 688; (45) 492.
 - in New York, (49) N.Y.Cornell 92.
 - on Chicago market, (45) 90.
 - relation to farm wages, (44) 89.
 - relation to manufactures, (50) 691.
 - treatise, (43) 394.
- producers, authorizing association, (46) 90.
- production and exports, (48) 892.
- protective tariff for, (45) 595.
- receipts and exports at New York City, (41) 294; (45) 90.
- standardization, (48) U.S.D.A. 890.
- systematizing distribution, (44) 91.
- tariff revision for, (46) 495.
- tariff schedule in Italy, (46) 595.
- trade in Holland, (41) 92.
- trade in Italy, (46) 92.
- trade in 1920, (45) 90.
- warehouses, operation, (42) N.C. 392.
- warehousing, (50) U.S.D.A. 293.

Agricultural—Continued.

- profits and taxes in France, (49) 892.
- program for Southern States, address, (42) 302.
- promotion school, object, (45) 196.
- prosperity and European credits, (43) 393.
- prosperity, foundations, (45) 293.
- prosperity in 1920, (43) 92.
- publications, filing, (44) Kans. 795.
- purchase societies in Germany, (43) 94.
- questions, technical survey, (49) 487.
- readjustments, (48) U.S.D.A. 890.
- regions of Portugal, (47) 297.
- research—
 - administration, (49) 707; (50) 896.
 - and seed testing, (44) 233.
 - as affected by the war, (43) 707.
 - at experiment stations, editorial, (46) 101.
 - better illustrative material for, (42) 101.
 - cooperation and individualism in, (42) 724.
 - cooperation in, (41) 609; (48) 7.
 - coordinating in South, (44) 498.
 - genius in, editorial, (44) 705.
 - impartiality of, (43) 598.
 - importance and needs, (43) 704, 707, 710.
 - importance of administration in, (48) 101.
 - in America, (50) 93.
 - in America and Victoria, (41) 296.
 - in Argentina, (42) 294.
 - in British Colonies, (42) 99.
 - in California, beginnings of, (41) 401.
 - in Canada, (47) 499; (49) 100.
 - in Chile, (41) 696.
 - in China, (42) 799.
 - in East African Protectorate, (42) 99.
 - in France, (42) 396.
 - in Great Britain, (41) 390, 796, 894; (42) 697, 798; (44) 599; (46) 294; (47) 896; (48) 701.
 - in Great Britain, Canada, and France since the war, (50) 301.
 - in Latin America, (42) 798.
 - in Quebec, (41) 296.
 - in Scotland, (41) 797; (44) 390; (48) 192.
 - in Tropics, organization, (42) 599.
 - in United States, (48) U.S.D.A. 895.
 - in Victoria, (44) 896.
 - in West Indies, (42) 198.
 - Institute in Palestine, (46) 798.
 - national policy, (46) 301; (47) 297.
 - need of funds, (43) 395.
 - organization, (43) 698.

Agricultural—Continued.

- research—continued.
 - papers on, (49) 596.
 - Polish Institute for, (47) 200.
 - present needs and importance, (41) 604.
 - private contributions, editorial, (45) 401.
 - problems and methods, (42) 201.
 - project essentials, editorial, (43) 302.
 - promoting high standards in, (49) 492.
 - regulations for grants in England and Wales, (43) 195.
 - relation to Federal Government, (49) 7.
 - relation to public welfare, (49) 492.
 - stage of diminishing returns, (50) 401.
 - value to the farmer, (45) 84.
 - worker, environment, (49) 596.
 - workers, facilities at Rothamsted for, (50) 400.
- resources of—
 - Argentina, (43) 487.
 - Canada, (50) 793.
 - French East Africa, (42) 896.
 - Manchuria, (49) 694.
 - Montana, (41) 294.
 - Morocco, (41) 389.
 - Nebraska, (41) 692.
 - New York, (41) 294.
 - Philippine provinces, (46) 391.
- school—
 - established in Peru, (42) 200.
 - for young girls, (48) 297.
 - high, of Berlin, (46) 497.
 - high, of Hohenheim, (43) 97; (44) 596.
 - in Milan, (47) 597.
 - new, in Southern France, (45) 99.
 - v. forest academy, (44) 93.
- schools—
 - and vineyard practices in Alsace, (46) 194.
 - continuation, in Czechoslovakia, (44) 93.
 - county high, in Mississippi, (41) 595.
 - evening, (50) 495.
 - in Algeria, (42) 494.
 - in Brazil, (43) 97.
 - in Canada, (45) 495.
 - in China, (47) 695; (49) 796.
 - in Czechoslovakia, (46) 497.
 - in Georgia, (41) 391; (45) 696.
 - in Germany, (44) 390, 695, 896.
 - in Italy, reform, (45) 597.
 - in Norway, (48) 496, 795.
 - in Quebec, (48) 395.
 - inspection tour in France, (47) 194.
 - movable, in Portugal, (41) 596.

Agricultural—Continued.

schools—continued.

rural junior high, in Virginia, (43) 597.

secondary, science in, (42) 691.

summer, in Canada, (44) 696.

situation, (45) U.S.D.A. 85.

situation in Czechoslovakia, (50) U.S.D.A. 296.

situation in Hungary, (50) U.S.D.A. 296.

situation in 1919, (41) U.S.D.A. 891.

Society of South Carolina, (41) 897.

staples and the tariff, (49) 794.

station administration, human problem in, (49) 596.

statistics, U.S.D.A. (47) 94, 194, 395, 492, 693, 797, 895; (48) 289, 294; (49) 391.

statistics, (50) 194, 296.

statistics—

and bookkeeping organizations, (45) 494.

collection and use, (46) 496.

foreign, handbook, (46) U.S.D.A. 293.

graphic presentation, (46) Mont. 695.

importance, (42) 687.

international, (43) 896.

international yearbook, (48) 494; (50) 393.

of Algeria, (42) 594; (44) 91; (45) 898.

of Argentina, (42) 690; (44) 594; (47) 95.

of Arizona, (49) 392.

of Australia, (41) 493; (42) 894; (44) 792; (45) 397; (46) 497, 895; (48) 495, 894.

of Austria, (43) 595; (44) 294; (46) 92, 293.

of Belgium, (50) 594, 895.

of Belgium and Belgian Kongo, (44) 294; (48) 495.

of Brazil, (42) 896; (43) 595; (46) 496; (50) 596, 894.

of British colonies, (45) 898.

of British India, (43) 896.

of British possessions, (41) 295.

of Bulgaria, (44) 891; (50) 795

of California, (41) 594; (46) 389.

of Canada, (41) 295, 594; (43) 795; (44) 91; (45) 192; (46) 496; (48) 393, 894.

of Chile, (41) 594; (43) 295; (49) 895; (50) 393, 895.

of China, (45) 898.

of Colombia, (41) 594.

of Colorado, (49) 392.

of Connecticut, (49) 392.

of Czechoslovakia, (44) 792; (45) 494.

of Danube Basin, (50) 296.

of Denmark, (41) 94; (43) 295; (44) 492; (45) 90, 898; (46) 92, 93, 496; (49) 895.

Agricultural—Continued.

statistics—continued.

of Dutch colonies, (46) 93; (47) 96; (48) 496.

of Egypt, (42) 392; (46) 497, 895.

of England and Wales, (41) 388; (43) 395; (44) 389, 792; (45) 596; (49) 895.

of Esthonia, (50) 895.

of exports and imports, summary, (49) U.S.D.A. 391.

of Far Eastern Republic, (48) 495.

of Finland, (41) 388; (45) 295; (46) 93; (47) 395.

of France, (41) 893; (42) 594; (43) 795; (45) 597; (46) 392; (49) 296; (50) 394.

of French colonies, (43) 194.

of Germany, (42) 658.

of Great Britain, (47) 395.

of Iceland, (50) 795.

of Idaho, (45) 898.

of India, (41) 595, 893; (43) 492; (45) 597, 898; (46) 93, 293; (47) 298, 395; (48) 894; (50) 693.

of Ireland, (41) 492, 594; (44) 694; (46) 92; (50) 793.

of Italy, (41) 388; (43) 393, 896; (44) 693; (50) 693.

of Japan, (42) 492; (45) 898; (46) 497.

of Latvia, (49) 296.

of Massachusetts, (47) 95.

of Michigan, (47) 493; (50) 93.

of Montana, (46) 695.

of Morocco, (49) 895.

of Netherlands, (42) 191; (45) 397; (46) 93; (47) 96; (49) 296.

of New England, (47) 95.

of New South Wales, (46) 694; (49) 93.

of New Zealand, (41) 493; (42) 90; (43) 491; (45) 397, 895; (48) 495; (49) 392.

of Norway, (41) 594; (43) 795; (48) 393; (50) 795.

of Ohio, (41) 295; (43) 486; (45) 695.

of Peru, (45) 596; (47) 493.

of Philippines, (45) 696; (48) 392.

of Poland, (45) 693.

of Portugal, (41) 493; (47) 298.

of Roumania, (42) 90; (44) 91; (50) 596.

of Russia, (41) 389, 893.

of Saxony, (45) 90.

of Scotland, (41) 594, 795; (42) 90, 790, 896; (43) 95, 896; (44) 694; (46) 496; (48) 793.

of Siam, (47) 493.

of South Africa, (41) 295.

of South Dakota, (43) 491.

of Spain, (47) 493.

Agricultural—Continued.

statistics—continued.

- of Sweden, (41) 594; (44) 492.
594, 894; (45) 397; (50) 296,
693.
- of Switzerland, (42) 90; (45) 695;
(46) 392, 497; (48) 393.
- of Texas; (48) 894.
- of the South, (50) 894.
- of Turkey, (45) 494.
- of Union of South Africa, (42) 90,
791; (44) 92, 492; (46) 696,
895; (49) 193; (50) 93.
- of United Kingdom, (41) 295, 892;
(42) 90; (43) 95, 491; (44)
694; (46) 696.
- of United States, (41) 492; (47)
95; (48) 597; (50) 795.
- of Uruguay, (41) 295; (44) 192;
(46) 392.
- of Urundi, (44) 595.
- of Venezuela, (48) 894.
- of Wisconsin, (45) 294; (46) 695;
(50) 894.
- organization in Spain, (45) 696
reform, (45) 494.
- theoretical bases, (44) 792.
- time and methods of collection.
(47) 194.
- students, boarding, supervised practical
work for, (49) 297.
- survey—
charts and maps, (49) 491.
in Manitoba, report, (49) 491.
of Europe, (50) U.S.D.A. 296.
of region of Fez, (48) 691.
- surveying, laboratory manual, (42)
887.
- syndicalism in France, (44) 489.
- tax in Austria, (45) 492.
- tax rates in France, (45) 594.
- teachers—
academic standards for, (43) 705.
course in entomology for, (47) 696.
outline of work, (48) 296.
training, (41) 296, 297, 298, 393,
394, 494; (42) 292, 295, 296.
298, 394, 395, 495, 596, 597.
691, 792; (43) 296, 297, 596.
696, 697, 705, 706; (44) 193.
492, 493, 595, 696; (45) 91;
(50) 795, 896, 897.
- training in Cuba, (49) 696.
- training schools, (48) 496.
- tenancy, *see* Land tenancy and Land
tenure.
- terminology, definitions, (50) 200.
- terminology, Norwegian, (43) 98.
- tools, average accomplishment, (49)
189.
- training camp at Wellesley College,
(41) 391.
- training for ex-service men, (43) 93.
- tribunal of investigation, (49) 388.
- village community, origin, (48) 892.
- village in Russia, life in, (49) 694.

Agricultural—Continued.

- wages, *see* Agricultural labor wages
and Wages.
- war damages, guide for estimating,
(43) 290.
- Agriculture—
Act of Great Britain, (46) 595; (47)
297.
- activities of Bureau of Markets in ex-
port trade, (42) 287.
- address on, before Governors' Confer-
ence, (41) U.S.D.A. 99.
- address to bankers on, (42) 87.
- administration of bureaus in Philip-
pines, (49) 193.
- after-the-war problems in, (41) 888,
American—
atlas of, (47) U.S.D.A. 414.
economic history of, (42) 286.
economic history, treatise, (50)
691, 792.
- environment in history of, (48)
94.
- graphic summary, (48) U.S.D.A.
289.
- relation to European situation,
(47) 296.
- an advertising opportunity, (49) 190.
- and dairying, (50) 891.
- and foreign trade, (43) U.S.D.A. 490.
- and home economics, cooperative ex-
tension, (49) U.S.D.A. 494.
- and industry, balance between, (46)
387.
- and irrigation in tropical climates,
treatise, (46) 282, 584.
- and meteorology, (45) 417.
- and nature study, treatise, (44) 898.
- and population in Galloway, (48) 690.
- and rural life in California, treatise,
(48) 893.
- and rural life in Michigan, treatise.
(48) 391.
- and soils of Southern States, treatise,
(45) 18.
- and taxes in France, (46) 894.
- and the community, treatise, (47) 297.
- and the International Labor Organiza-
tion, (49) 693.
- and transportation, (50) 490.
- and war, (49) 595.
- as a business, (44) 691.
- as training for citizenship, (44) 296.
- banking system for, (47) 192.
- Belgian exchange scholarships in, (45)
99.
- books for high schools, (43) 698.
- British Board of, reorganization, (42)
98, 697.
- British, history of, (48) 94.
- business of, course in, (50) 198.
- chair of, at University of Liverpool,
(50) 400.
- chair of, in Victoria College, (48) 900.
- chemical aspects, (48) 801.
- chemistry of, (45) 310.

Agriculture—Continued.

- degree course in, (46) 790.
- degree of bachelor of, (49) 500.
- Department of, *see* United States Department of Agriculture.
- economics of, treatise, (47) 689.
- effect of business, (50) 198.
- effect of embargo on, (48) 94.
- Egyptian, basis of, relation to decline in yield, (48) 813.
- electrical energy in, (48) 888.
- elementary—
 - course in, (50) 496, 796.
 - guide for teachers, (42) 795.
 - manual, (41) 96, 298.
 - methods of teaching, (41) 395.
 - principles, (48) 395.
 - syllabus, (41) 494.
 - textbook, (48) 497, 693.
- essays on, (46) 295.
- evolution of, nomad hypothesis, (45) 491.
- existing systems in Europe, (50) 291.
- financing, (47) 296; (50) 593.
- for high schools in North Dakota, syllabus, (50) 796.
- for high schools, textbook, (50) 94.
- for Kansas common schools, textbook, (50) 298.
- for rural schools, rooms and equipment, (48) 394.
- for southern schools, (48) 693.
- French, and socialism, (49) 594.
- French, Congress of, proceedings, (48) 496.
- graduate instruction in Canada, (49) 796.
- graduate scholarships in, (48) 500.
- high school students of, data regarding, (50) 394.
- home and club work, (41) 97.
- Illinois system, (44) Ill. 720.
- importance in America, (43) 393.
- importance of research in animal pathology to, (45) 73.
- in Alaska, (41) 594.
- in Algeria, (41) 493, 893; (48) 393, 792; (49) 295, 895; (50) 193.
- in Alsace-Lorraine, (42) 392.
- in America, beginnings, treatise, (49) 191.
- in America in 1775, treatise, (41) 527.
- in America, in slavery era, (41) 890.
- in American Association for Advancement of Science, (44) 102; (46) 2.
- in ancient Greece and Rome, (46) 494.
- in Argentina, (45) 893.
- in Armenia, (50) 193.
- in Australia, (42) 593; (48) 894.
- in Austria, (49) U.S.D.A. 93.
- in Austria-Hungary, statistics, (42) 291.
- in Belgium, (47) 492, 694.
- in Belgium, government aid, (46) 292.
- in Brazil, treatise, (41) 889.
- in British Isles, history of, (41) 387.

Agriculture—Continued.

- in British self-governing dominions, (41) 388.
- in Burma, (48) 94.
- in Canada, (44) 387; (46) 694; (48) 790.
- in Canada, development, (48) 894.
- in Canada, new policy, (42) 593.
- in central France, (43) 895.
- in Chile, (41) 594.
- in China, development, (45) 696.
- in Chosen, (41) 94; (44) 92.
- in Colombia, (46) 391.
- in colonies, organization, (44) 92.
- in cut-over redwood lands, (49) Calif. 90.
- in Cyprus, (43) 795.
- in Cyrenaica, (42) 392.
- in Czechoslovakia, (48) 791.
- in Czechoslovakia, application of Eight-hour Day Act, (47) 392.
- in Denmark, (44) 388; (49) 190; (50) 296.
- in Denmark and world depression, (50) 794.
- in Denmark, development, (48) 392.
- in Denmark, treatise, (41) 194.
- in Dutch East Indies, (45) 596.
- in Dutch East Indies, development, (47) 492.
- in early Britain, (45) 895.
- in early Latium, (41) 294.
- in eastern Europe, (47) 94.
- in Ecuador, (47) 596.
- in England, (48) 690.
- in England, development, (43) 487.
- in England during two wars, (43) 894.
- in England since 1914, (48) 790.
- in Federated Malay States, (48) 732.
- in Finland, (41) 594; (50) 290, 892.
- in France, (41) 388, 490; (42) 287, 391, 790; (47) 297.
- in France, comparison with other countries, (43) 94.
- in France, organization, (44) 492.
- in France, relation to improvement of the Rhone, (41) 889.
- in France, treatises, (41) 294, 592, 791, 792, 889.
- in France, winter schools, (50) 597.
- in French colonies, (47) 297.
- in French West Africa, (47) 694.
- in Friesland, (44) 891.
- in Georgia, development, (49) 92.
- in Germany during the war, (45) 596.
- in Germany, foreign labor in, (50) 890.
- in Germany, present condition, (43) 94.
- in Germany, problems, (42) 592, 658.
- in Germany, social and economic aspects, (42) 687.
- in Great Britain, (41) 92, 93, 293, 591, 792; (44) 90, 792.
- in Great Britain, contribution of land-owners, (50) 792.

Agriculture—Continued.

- in Great Britain, policies, (42) 287, 391, 592.
- in Great Britain, present status, (47) 596.
- in Greece, (47) Ill. 815.
- in Guadeloupe, (47) 297.
- in Guatemala, (41) 492.
- in Hawaii, (41) 492.
- in Hungary, (49) 894.
- in Ireland, (50) 793, 892.
- in Italian colonies, (46) 92.
- in Italy, (41) 94, 793.
- in Italy, Government promotion, (44) 692.
- in Italy, relation to rainfall, (45) 809.
- in Japan, (41) 493; (43) 395; (46) 390.
- in Japanese Sakhalin, (42) 393.
- in Manitoba, relation to climate, (47) 16.
- in Mexico, (47) 194.
- in Missouri, history, (46) 495.
- in Morocco, (48) 792.
- in Netherlands, (44) 293; (46) 597; (50) 193.
- in Netherlands, influence of hydraulic works, (42) 183.
- in New Jersey, graphic summary, (50) 594.
- in New South Wales, (49) 93.
- in New Town, (42) 791.
- in New York State, manual, (47) 492.
- in New Zealand, (50) 693.
- in Northern Africa, future, (49) 595.
- in northwestern grain raising areas, (50) 192.
- in Norway, (46) 898; (49) 896.
- in oases of Libyan Desert, (44) 193.
- in Peru, (47) 694.
- in Philippines, (43) 487.
- in Portugal, (47) 297.
- in Portugal, potentiality, (49) 93.
- in Quebec, progress report, (42) 494.
- in Roumania, (48) U.S.D.A. 597.
- in Russia, activity of People's Commissariat, (49) 292.
- in Russia, treatises, (41) 793, 893.
- in Saar region, (49) 389.
- in Scotland during the war, (42) 790.
- in Scotland, economics of small farms, (43) 594.
- in Serbian nation, (41) 294, 890.
- in Shan States, taungya cultivation, (49) 322.
- in Somalia, (47) 597.
- in South Africa, (41) 893; (48) 495.
- in southern Indiana, (50) 390.
- in southwestern Indiana, (48) 690.
- in Soviet Russia, (48) 691.
- in Spain, (41) 591; (42) 490, 599.
- in Spain, official chamber, (42) 100.
- in Spain, relation to transportation rates, (43) 488.
- in Switzerland, (41) 591; (42) 688; (46) 591; (47) 294, 491, 596, 691; (48) 187; (49) 389.

Agriculture—Continued.

- in the primary school, (41) 596, 597.
- in Thuringia, changes in productivity, (47) 92.
- in Tropics for ex-service men, (43) 93.
- in Tropics, treatise, (49) 96.
- in Tunis, (48) 792.
- in United Kingdom, (41) 490.
- in United States, (45) 85.
- in United States and Great Britain as affected by the war, (41) 293.
- in United States, Government assistance, (42) 190.
- in United States, impressions, (44) 594.
- in United States, possibilities for further expansion, (42) 287.
- in Upper Peninsula, (48) Mich. 94.
- in Utah, (45) Utah 395.
- in Virginia, history of, (42) 490.
- in western India, (47) 596.
- in Wisconsin, history, (49) 794.
- in Yuma Mesa, possibilities, (42) Ariz. 341.
- intensive, importance in Germany, (45) 894.
- lessons in, manual, (42) 598.
- manual for teaching children, (47) 799.
- milpa system, (46) 595.
- modern, encyclopedia, (46) 898.
- native, in Africa, (44) 293, 294.
- nature study, treatise, (44) 795.
- occupations in, (47) 695.
- on Cape Cod, (48) 790.
- on large farms southeast of Paris, (49) 894.
- place in industry, (41) 92, 489.
- place in reconstruction, treatise, (41) 489.
- postgraduate courses in, at Pusa, (50) 297.
- power applied to, (43) 591; (45) 184.
- profit and loss sharing, (43) 895.
- profit-sharing in, (43) 793.
- radioactivity in, (48) 724.
- recent decline in, cause, (47) 297.
- recovery of, (50) 89.
- relation to meteorology, (48) 208.
- relation to population, (49) 568.
- rôle in economic development of United States, (48) 893.
- rôle in life of nation, (49) 191.
- rôle of plant pathology in, (49) 240.
- Roman, and livestock raising, (48) 392.
- rotation of chemical elements in, (50) Mich. 411.
- school of, in University of Cambridge, (48) 395.
- secondary, manual, (41) 95.
- self-supporting, emergency commission for, (50) 891.
- situation in world, and European consumption, (49) 596.
- southern, organization, (42) 594.
- standards of production, (50) 290.
- statistical method in, (50) 298.
- study in elementary school, (50) 596.

Agriculture—Continued.

- substances important in, treatise, (50) 311.
 - supervised practice in, manual, (42) 195.
 - taxation affecting, (48) 188.
 - teaching, (50) 693.
 - teaching, guide for, (44) 794.
 - teaching methods, (45) 91.
 - textbook, (41) 96, 596, 597; (42) 195, 795; (46) 95.
 - theory of intensity, illustration, (44) 890.
 - tropical and subtropical, (49) 493.
 - tropical, for rural schools, (48) 297.
 - tropical, guide, (50) 637.
 - tropical, technical education in, (42) 599.
 - tropical, treatise, (41) 194; (46) 32.
 - tropical, West-Indian College of, (49) 95.
 - unemployment insurance in, (46) 495.
 - use of electricity in, (43) 285; (50) 388.
 - use of explosives in, (50) N.J. 791.
 - uses of gypsum in, (49) 124.
 - valuation, bookkeeping, and calculation in, (47) 695.
 - vitalizing in rural schools, (44) 94.
- Agriilus**—
- angelicus n.sp., description, (42) 655.
 - angelicus, notes, (44) 256, 553.
 - anxius, notes, (50) Conn.State 50.
 - arcuatus torquatus, life history, (41) 57.
 - restrictus, notes, (43) 57.
 - ruficollis, studies, (49) Wis. 654.
 - sinuatus, *see* Pear tree borer, sinuate.
 - spp., biology, (49) 848.
 - spp., life history. (44) 164.
- Agriolimax agrestis**—
- notes, (47) N.Y.Cornell 848.
 - studies, (44) Oreg. 158.
- Agriotes**—
- manicus, notes, (47) N.Y.Cornell 848.
 - obscurus, life history, (46) 462.
 - spp., notes, (48) 460.
- Agriol treatment of moldy rot disease**, (50) 49, 250.
- Agro-geological bibliography**, (47) 211.
- Agromyza**—
- lantanae, studies, (42) 158.
 - laterella in New Jersey, (41) 549.
 - spp., parasites, (41) 63, 64.
- Agonomic**—
- and agrologic survey of Sétif region. (48) 420.
 - research, increasing efficiency, (48) 195.
- Agronomy**—
- degree course in, (46) 791.
 - higher education in Belgium, (47) 798.
 - instruction in Argentina, (42) 294.
 - specialists in, training, (47) 897; (48) 297.
 - station of Yonne, (46) 294.
 - teaching, improvement, symposium, (48) 195.

Agronomy—Continued.

- teaching in State agricultural colleges. (45) 90.
 - terminology, (42) 529.
- Agropyron**—
- cristatum, culture, (44) Mont. 331.
 - cristatum, proliferation in, (47) 334.
 - repens, seeds, germination, (44) 232.
 - spp., analyses, (41) Wyo. 333.
- Agrostis**—
- alba, analyses, (41) Wyo. 333.
 - alba, description, (42) U.S.D.A. 340.
- Agrotis**—
- radians on maize, (41) 57.
 - segetum, enemies and diseases, (50) 255.
 - segetum, papers on, (44) 57, 758; (46) 51.
 - ypsilon, *see* Cutworm, black.
- Agusan**, natural resources and development, (45) 192.
- Air**—*see also* Atmosphere.
- acidity of, studies, (44) 209.
 - and its ways, treatise, (49) 614.
 - carbon dioxid supplying power, (48) 826.
 - cleaners for agricultural motors, (48) 684.
 - conditioning in private houses, (43) 486.
 - currents, relation to droughts, (42) U.S.D.A. 618.
 - ionization by plants, (43) 225.
 - irradiated by ultra-violet light, effect on growth in rats, (50) 265.
 - lift pumps, loss of efficiency in, (47) 887.
 - maps for forest areas, (43) 840.
 - motion in lowest layers of atmosphere, (42) 14.
 - movements, studies, (43) U.S.D.A. 118.
 - of Sao Paulo, analysis, (45) 210; (49) 413.
 - optics of, (42) 511.
 - pollution by coal smoke, (44) 430.
 - pressure maps, preparation, (48) U.S.D.A. 209.
 - routes, selection of, (44) U.S.D.A. 416.
 - soil, carbon dioxid in, (45) 323.
 - soil, investigations, (45) 16.
 - soil, rôle in hydrophytic habitats, (49) 29.
 - space, insulating properties, (49) 187.
 - streams in Canadian wheat region, (47) 16.
 - temperature, weekly average, (49) Ky. 509.
 - upper, spores in, (49) 747.
- Aircraft**—
- protection from insects, (50) 555.
 - use in forestry and logging, (44) 148.
- Airplane**—
- fabric, tests, (44) U.S.D.A. 138.
 - timber, effect of incipient decay on mechanical properties, (47) 251.
 - use in dusting trees, (49) 654.

Airplane—Continued.

- use in forest insect control, (49) Ohio 352.
- use in forest patrol work, (49) 838.
- use in soil survey work, (49) 616.
- woods, decay and discolorations in, (49) U.S.D.A. 351.

Airplanes, effect on hail, (43) 618.

Aitken, J.—

- biographical sketch, (42) 100.
- scientific papers of, (50) 414.

Ajowan as source of thymol, (41) 825.

Akala berry of Hawaii, (45) 742.

Alabama argillacea, control, (49) V.I. 352; (50) 658.

Alabama—

- Canebrake Station, notes, (41) 599; (44) 196; (45) 600.
- College, notes, (43) 99, 799; (44) 395; (45) 95, 498, 900; (47) 98, 600; (48) 695; (49) 697; (50) 396, 899.
- College Station, report, (41) 397; (42) 898; (43) 98; (44) 795.
- College Station, report of director, (45) 94.
- Station, notes, (43) 799; (44) 395; (45) 95, 900; (47) 98, 600; (48) 695; (49) 697; (50) 396.
- Station, report, (50) 696.
- Tuskegee Station, notes, (49) 496.

Alahee tree in Hawaii, (46) 42.

Alanin, effect on—

- carbon dioxid-combining power of blood plasma, (47) 64.
- starch hydrolysis, (46) 707.

Alaska—

- College, notes, (46) 298; (48) 98; (49) 299.
- Stations, notes, (42) 93; (46) 97; (50) 899.
- Stations, report, (41) 98; (44) 393, 598; (47) 599; (49) 494; (50) 597.

Alberia gardneri, studies, (42) Guam 37.

Albina, use of term, (43) 433.

Albinism—

- in beans, studies, (45) 427.
- inheritance in cereals, (43) 132.

Albino plants, effect of sugar on growth, (44) 223.

Albizzia—

- lebbek, notes, (46) 737.
- spp., fungus affecting, (42) 51.

Albugo, spp. on sweet potato, (43) 152.

Albumin—

- colloid chemistry, (41) 801.
- determination in urine, (43) 206.
- egg—
 - adsorption in solution and at interfaces, (47) 802.
 - alkalinity determination, (42) 614.
 - complete food for *Isaria densa*, (42) 821.
 - crystalline, of hen and duck, (42) 774.
 - cystin and noncystin sulphur in, (49) 503.

Albumin—Continued.

egg—continued.

- digestion experiments, (47) 166.
- effect of injection in dogs, (42) 676.
- effect of quinin, (44) 566.
- gold number determination, (43) 12.
- in food pastes, determination, (47) 611.
- new sulphur-containing amino acid from, (49) 714.
- of hen and duck, antigenic specificity, (42) 774.
- of wheat bran, analyses, (50) 711.
- pepsin digestion of, (42) 165.

Albuminoid ammonia test, (41) 204.

Albuminoids—

- as affected by sewage organisms, (43) 791.
- determination in preserved milk, (41) 505.

Alcides—

- leucogrammus, studies, (44) 660.
- mali n.sp., description, (43) 163.

Alcohol—

- absolute, preparation, (49) 114.
- and carbohydrates, treatise, (44) 409.
- as fuel in England, sources, (49) 185.
- as fuel, new sources, (43) 617.
- as gasoline substitute, (43) 187.
- as motor fuel, (44) 785; (47) 90, 189; (48) 90; (49) 590; (50) 588.
- as motor fuel, manufacture, (48) 886.
- as motor fuel, manufacture from waste molasses, (49) 387.
- as motor fuel, production and utilization, treatise, (49) 286.
- carburetion, (45) 185.
- denatured, from waste molasses, (43) 591.
- denatured, use in judging freshness of milk, (41) 311.
- determination, (45) 508.
- effect on—
 - botulinus toxin, (46) 361.
 - digestion of fibrin and caseinogen, (42) 60.
 - fertility of rats, (48) 366.
 - germ cells in mammals, (41) 863.
 - heredity in fowls, (42) 766.
 - reproductive tissues, (41) 862.
 - tetanus spores, (44) 780.
 - white rats, (47) 277, 278.
- ethyl, *see* Ethyl alcohol.
- from Arum, (41) 117.
- from grape-shoot silage, (41) 618.
- from oat and peanut hulls, (48) 713.
- from sulphite waste liquor, (42) 615; (43) 416.
- from tropical plants, (47) 207.
- germicide value, (44) 680.
- grain, substitutes for, (47) 13.
- industrial, manufacture, (46) 114.
- industry in France, (43) 261.
- inhibitive effect on fermentation, (42) 609.

Alcohol—Continued.

manufacture from—

- carob beans, (46) 509.
- cassava, (46) 808.
- corncocks, (46) 208.
- grape marc, (46) 509.
- megasse, (47) 113.
- molasses, (44) 414; (45) 83; (47) 113, 508.

various residues, (47) 613.

methyl, *see* Methyl alcohol.

power, from calcium carbid, (50) 287.

production, yeast for, (41) 508.

test for grading milk, (49) 716.

testing device, (43) 712.

use for power, (43) 389.

use in botulism, (42) 261.

Alcohol-ether mixtures, determination of ether in, (49) 114.

Alcoholic—

fermentation, *see* Fermentation.

treatment of white rats, genetic significance, (49) 567.

Alcoholism, effect on white rats, (48) 567.

Alcohols—

denatured, for fat extraction test, (49) Wis. 611.

new, from fish liver oils, (47) 311.

Aldehyde—

production, (44) 610.

production by chlorophyll, (41) 133.

Aldehydes—

effect on protein hydrolysis, (43) 110.

in soils, effect of fertilizers on, (43) Pa. 519.

Alder—

beetle, biology, (41) 59.

black, leaves and twigs, feeding value, (45) 774.

sawfly leaf miner, remedies, (41) 759.

scale, new, studies, (41) 664.

white, relation to soil improvement, (50) 838.

Aldoses—

in presence of other carbohydrates, determination, (50) 614.

iodometric determination, (50) 613.

Aleochara algarum, life history and habits, (50) 850.

Aleomyia, new genus, erection, (50) 457.

Aleurobius farinae—

in stored grain, (44) 851.

notes, (41) 463; (48) 462.

summary of information, (42) 180.

Aleurocanthus—

spiniferus, notes, (47) 255.

woglumi, *see* Citrus black fly.

Aleurodiscus—

cocois, notes, (45) V.I. 150.

manni n.sp., description, (50) 155.

neglectus on avocados, (42) 546.

Aleurodiscus, studies, (42) 147.

Aleurone grains—

development in vacuoles, (48) 328.

formation, (50) 222.

Aleurothrixus—

floccossus, notes, (45) V.I. 150.

howardi, notes, (41) Fla. 548; (48) 854.

Aleyrodes—

azaleae n.sp., description, (43) 557.

barodensis, studies, (47) 255.

comata, notes, (43) 52.

essigi n.sp., description, (47) 657.

vaporariorum, *see* White fly, greenhouse.

Aleyrodidae—

economic, of India, (47) 255.

in California, catalogue, (47) 657.

in India, (45) 656.

of Brazil, catalogue, (50) 556.

of Jamaica, (50) 556.

Alfalfa—

acid content, relation to soil acidity, (42) 424.

American, in Sweden, (48) 832.

amino acid content, (46) 504.

analyses, (47) Conn.State 570; (50) Oreg. 7.

and clover mixture, tests, (41) 230.

and orchard grass hay, (45) R.I. 229.

and silage, feeding value, (50) Ohio 170.

and timothy hay, (45) R.I. 229.

and timothy hay, yields, (47) Wis. 431.

and timothy mixtures, Wis. (42) 632, (44) 227.

anthracnose, notes, (48) 741.

aphis, notes, (42) 750.

as affected by—

alkali salts, (41) 623.

calcium, (46) Ky. 816.

inoculation, (49) Ariz. 620.

pH value, (49) 825.

sodium chlorid, (50) 625.

soil reaction, (44) 633.

superphosphate, (47) Minn. 124.

windbreaks, (44) N.Dak. 524.

as cover crop, (43) Wash. 743; (45)

R.I. 230, Wash. 236; (46) U.S.D.A.

531; (47) Wash.Col. 535.

as forage crop, (44) Utah 525; (46) Mass. 30.

as green manure, (44) Del. 431, Alaska

522; (46) 320, U.S.D.A. 531; (47)

Miss. 217.

as hay and pasture crop, (45) U.S.D.A. 86.

as hog pasture, (41) U.S.D.A. 72, Ariz. 369, 675; (43) U.S.D.A. 376.

as nitrogenous fertilizer, (46) 518.

as pasture crop, (42) U.S.D.A. 370;

(45) U.S.D.A. 575; (46) Mont. 364,

U.S.D.A. 767; (47) Ark. 776.

as protein supplement for pigs, (49) Mich. 469.

as shade crop for orchards, (43) Oreg. 145.

Alfalfa—Continued.

- as silage crop, (41) Mo. 334, 732; (46) U.S.D.A. 531.
- as sod crop, (46) U.S.D.A. 130.
- as soiling crop, (46) U.S.D.A. 531.
- as sole feed for cattle, (47) 278.
- bacteria, sensitivity to acid, (42) Wis. 324.
- barium in, (46) Colo. 28.
- black, feeding value, (42) 469.
- breeding experiments, (42) 32; (44) Ariz. 524, 827; (45) N.Dak. 225, 734; (48) N.Dak. 30, Can. 31, Mich. 224, Ariz. 433; (50) Can. 433.
- breeding in Sweden, (46) 728.
- brown and black, losses of organic matter, (42) 469.
- brown hay, loss of crude and digestible nutrients in, (49) 669.
- campaigns, county, (49) Mich. 97.
- caterpillar, control, (43) U.S.D.A. 357.
- chopped, analyses, (46) Tex. 675.
- clover stem borer on, (44) U.S.D.A. 164.
- composition and digestibility, (41) Mass. 275.
- cost of production in Argentina, (43) 487; (44) N.Dak. 88, U.S.D.A. 789.
- cotton root rot fungus affecting, (50) 747.
- cross-fertilization studies, (45) N.Dak. 225.
- crown gall, biology, (44) 748; (49) 146.
- crown gall, notes, (45) 48.
- crown wart, studies, (44) 643, 748.
- culture, (41) Kans. 33, N.J. 35, Hawaii, 138, Can. 528, N.Dak. 822, N.Dak. 824; (42) Md. 135, 229, Mich. 397, Va. 436, Wis. 632, 826, N.J. 827; (43) Mont. 332, Idaho 738, U.S.D.A. 738; (44) Hawaii 29, U.S.D.A. 34, U.S.D.A. 138, U.S.D.A. 229, U.S.D.A. 230, Alaska 328, Alaska 329, Mont. 331, Alaska 522, N.Dak. 524; (45) Kans. 33, Miss. 126, Idaho 223, Mo. 224, R.I. 229, 631, N.Dak. 734; (46) 31, 131, U.S.D.A. 724, U.S.D.A. 831; (47) Miss. 33, Okla. 33, Alaska 527; (48) N.Dak. 225, U.S.D.A. 732; (49) Wis. 31, 329, Okla. 414, Alaska 426, Tex. 429, Mont. 430, Ky. 525, Wis. 630, Can. 734; (50) N.Mex. 29, Mont. 134, Conn.Storrs. 334, Alaska 532, Mont. 535.
- culture—
 - directions, (45) N.Dak. 225; (47) Miss. 428; Miss. 824.
 - in Alaska, (41) Alaska 31.
 - in Argentina, (50) 29.
 - in British Columbia, (42) 733.
 - in India, (46) 728.
 - in Michigan, (41) Mich. 435.
 - in North America, (47) 529.

Alfalfa—Continued.

- culture—continued.
 - in South Dakota, U.S.D.A. (41) 716, 717.
 - in western Kansas, (42) Kans. 32.
 - on acid soils, (48) Wis. 213.
 - on Canada prairies, (41) 732.
 - on sandy soils, (41) Wis. 18.
 - on Yuma projects, (43) U.S.D.A. 393.
 - papers on, (43) 528.
- curing, effect on composition, (44) Kans. 224.
- curing, studies, (41) Kans. 35.
- cutting at different stages, (41) Kans. 32.
- cutting trials, (49) Wis. 630.
- digestibility and productive value, (47) Tex. 472.
- disease, little-known, (41) 656.
- diseases, (46) 546.
- diseases in California, (50) 447.
- distance-of-cultivation test, (49) Mont. 130.
- drought resistance, (44) Wis. 227.
- dry and green, effect on calcium and phosphorus equilibrium in cows, (47) 875.
- dry-land, culture, (44) U.S.D.A. 229.
- early growth in alkali soil, (42) Utah 28.
- eelworm disease, description, (50) U.S.D.A. 145.
- effect of drainage, (42) Wis. 384.
- effect of prolonged production, (44) Kans. 213.
- effect on—
 - following crop, (44) R.I. 31, R.I. 33, U.S.D.A. 33, 532; (45) N.Dak. 226, Del. 622; (47) Wyo. 131, Miss. 825; (49) Mont. 129, Nebr. 733.
 - nitrogen content of soil, (42) 426.
 - nitrogen fixation, (48) Calif. 517.
 - potato crop, (41) Nebr. 434.
 - soil reaction, (41) 319.
 - testes of cockerels, (46) 271.
- ensiling, Italian method, (50) 468.
- fat-soluble vitamin in, (42) 556.
- feeding rack, plans, (42) Mont. 86.
- feeding value, (42) U.S.D.A. 374; (49) Wyo. 867; (50) Oreg. 66.
- fertilizer experiments, (41) Kans. 33, Can. 528, N.Dak. 823; (42) Va. 21, 98, Oreg. 221, 430, Va. 436, Minn. 731; (43) Okla. 32; (44) Hawaii 29, Kans. 225, Minn. 321; (45) R.I. 229, Okla. 430; (46) Kans. 30, Mo. 326, Kans. 435; (47) Okla. 33, N.Mex. 433, Wash.Col. 529, Miss. 825; (48) 322; (49) 31, 329, Kans. 427, Miss. 428, N.Mex. 517, Ga. 524; (50) Minn. 121, N.Mex. 232, Conn.Storrs. 334.
- flowers, undetermined dipteran in, (48) 554.

Alfalfa—Continued.

- for improvement of sandy soil, (43) 721.
- for young pigs, (42) Mont. 67.
- forage, feeding value, (47) Wash.Col. 575.
- Fusarium wilt, (43) N.Mex. 345.
- germination as affected by—
 - fertilizers, (44) Va. 721.
 - H-ion concentration, (43) 525.
 - organic substances, (41) 523.
- green, effect on flavor of milk, (50) U.S.D.A. 376.
- green manuring experiments, (42) Miss. 622.
- ground, for pigs, (41) N.J. 73.
- growth as affected by lime, (45) Iowa 117.
- hard seed, tests, (49) Colo. 441.
- Hardigan, description, (47) Mich. 131.
- hardiness in, relation to root development, (45) 35.
- hardy, culture experiments, (47) Mich. 829.
- hardy strains, (48) Ky. 129.
- hardy varieties, (47) Iowa 734.
- hay—
 - amino acid content, (41) 367.
 - analyses, (44) Wash. 471, Ariz 568; (45) 775; (48) 68.
 - analyses and digestibility, (45) 468.
 - and straw, analyses, (41) Ariz. 367.
 - and sunflower silage, comparison, (43) Mont. 68.
 - as affected by gypsum, (49) 727.
 - as corn supplement, (42) Kans. 375.
 - at different stages, tests, (46) 195, Kans. 475.
 - cost of production, (42) Mo. 188; (47) Idaho 593.
 - digestibility and productive value, (47) Tex. 472.
 - effect on calcium and phosphorus equilibrium in cows, (48) 477.
 - effect on milk production, (50) W.Va. 73.
 - feeding racks, design, (43) 91.
 - feeding value, (42) Guam 64, Tex. 369, Calif. 868; (44) Kans. 769; (45) 96; (46) Wyo. 676; (47) Okla. 71, Minn. 374; (48) 769; (49) Okla. 467, N.Mex. 868, N.Mex. 869, 874.
 - for breeding ewes, (43) 870.
 - for brood sows, (41) N.Dak. 178.
 - for dairy cows, (41) Mo. 78, Mass. 275, 371, Ariz. 371; (42) Calif. 874.
 - for fattening cattle, (43) Ind. 870.
 - for horses, (41) Mass. 274.
 - for lambs, (41) 772.
 - for milk production, (48) 398.
 - liming experiments, (46) Md. 321.

Alfalfa—Continued.

- hay—continued.
 - making and storing, (46) U.S.D.A. 531.
 - methods of handling, (49) Colo. 86.
 - nitrogen distribution, (47) 10.
 - v. oat hay for calves, (42) Calif. 874.
 - v. Russian thistle for cows, (42) Kans. 264.
 - v. Sudan grass hay for dairy cows, (47) Ariz. 876.
 - v. sweet clover hay, (41) Kans. 71.
 - variety tests, (47) Pa. 429.
 - yields, U.S.D.A. (44) 136; (45) 531.
- heat-resistant varieties, (43) Ariz. 734.
- hopper on Arizona cotton, (42) Ariz. 357.
- hybridization, (47) 33.
- hybrids, comparison with parent forms, (45) 36.
- immature, vitamin content, (41) 762.
- in California, stem nematode, (50) 447.
- increase, (48) Mich. 396.
- inoculation experiments, (41) Alaska 31, Ga. 130, 523, 832; (44) Hawaii 29; (47) Iowa 734; (48) Wash.Col. 832.
- insects affecting, (44) Kans. 249; (45) 551; (47) 655.
- irrigation experiments, (41) N.Mex. 139, Nev. 231, Nev. 728, 785; (42) 576; (43) Nev. 228, Utah 230; (44) U.S.D.A. 136; (45) Utah 431; (47) Oreg. 131, Calif. 631; (48) Utah 284, Calif. 528; (50) 829.
- land, requirements, (47) Ark. 732.
- leaf beetle, black, biology, (41) 59.
- leaf rust, notes, (45) 842.
- leaf spot, notes, (43) 652; (44) 48.
- leaf spot, studies, (41) U.S.D.A. 346.
- leaf weevil, parasite of, identity, (46) 857.
- leaves and stems, analyses, (45) Kans. 33.
- leaves, temperature, (50) 425.
- LeBeau, (49) Mich. 31.
- liming experiments, (42) 523, N.J. 826; (44) R.I. 32; (45) R.I. 229.
- limiting factor on Bombay soils, (41) 817.
- Macrosporium sarciniforme on, (44) 244.
- manuring experiments, (44) U.S.D.A. 127; (46) Kans. 30.
- meal—
 - analyses, (41) N.H. 68, Ind. 564, R.I. 564, Can. 565, Ind. 868, N.Y.State 868; (42) Mich. 63, 263, 560, Ind. 769, N.H. 769, Tex. 769, Mass. 866; (43) N.J. 69, Ind. 69, Ky. 373, N.J. 672, 867, Ind. 867; (44) Hawaii 71, 267, Mich. 568, Mass. 671, N.H.

Alfalfa—Continued.

meal—continued.

analyses—continued.

671; (45) Tex. 68, N.Y.State
469, N.J. 774, 872, Vt. 872;
(46) Mich. 168, N.H. 674, Tex.
675; (47) N.Y.State 172, Mass.
274, 275, Ind. 473, Conn.State
570, N.J. 571; (48) 68.

digestibility and productive value,
(47) Tex. 472.

for lambs, (42) Calif. 868.

for laying hens, (41) N.Mex. 571,
675.

for pigs, (41) 273.

preparation, (46) U.S.D.A. 531.

production, (43) U.S.D.A. 694.

methods of feeding, (50) Kans. 67.

mill, machinery for, (46) U.S.D.A. 531.

natural inoculation, (45) Colo. 213.

need for more in Michigan, (46) Mich.
598.

nitrogen distribution of proteins, (45)
717.

noninoculation through manure, (42)
Wis. 325.

notes, (48) Hawaii 330.

nurse crop for, (43) Wash. 737; (47)
Iowa 734.

on corn-belt farms, (41) U.S.D.A. 435.

pasture for pigs, (43) U.S.D.A. 466;
(44) N.J. 368, U.S.D.A. 771; (46)

S.C. 768; (47) N.Dak. 670; (48)
U.S.D.A. 271.

pasture, pork-producing value, (47)
Calif. 573.

pasture, supplemental seeds, compari-
son, (42) U.S.D.A. 374.

pasture with grain, feeding value for
pigs, (42) Calif. 870.

Peronospora attacking, (49) 542.

Peruvian, culture in United States,
U.S.D.A. (43) 528; (44) 230.

plant, analyses, (42) Oreg. 222.

plant, basic substances from, (50) 710.

potash fertilizers for, (41) Mass. 21.

production under irrigation, (45) Utah
632.

proteins in, (46) 801.

proteins in at different stages, (41)
Iowa 273.

pump irrigation for, (47) Nebr. 736.

quality as affected by fertilizers, (49)
Mich. 431.

residual effect, (41) Nebr. 433.

resistance to alkali, (43) Ariz. 724.

returns from, in Georgia, (49) 90.

root fungus, notes, (43) 243.

roots as affected by irrigation, (42)
Calif. 823.

roots, dry-rot disease, (48) 452.

roots, studies, (48) U.S.D.A. 130.

roots, vitality, (41) 639.

rotation experiments, (41) Kans. 32,
Kans. 33, Kans. 41, Del. 136, N.Dak.

139, N.Dak. 823; (42) U.S.D.A. 336;

Alfalfa—Continued.

rotation experiments—continued.

(44) Kans. 213, U.S.D.A. 732; (46)

Kans. 435; (47) Minn. 130; (49)

Wyo. 429, Oreg. 526; (50) N.Y.State
422.

seed—

as affected by age, (41) 639.

chalcis fly in, (43) U.S.D.A. 364.

from Argentina, identification, (50)
740.

identification, (45) 632.

Italian, identification, (46) 732.

nitrogen distribution in, (45) 501.

production, (42) U.S.D.A. 337,

Mich. 632; (46) 31; (49) Mont.

430; (50) U.S.D.A. 132.

production and marketing, outlook,
(44) 143.

production, factors affecting, (44)
Colo. 229.

production in Argentina, (45) 824.

production, meteorological require-
ments, (42) Utah 806.

production, relation to weather,
U.S.D.A. (41) 716, 732.

scarification, (44) Wis. 226.

scarification, effect on longevity,

(49) 130.

source of, studies, (41) N.J. 35.

testing, (41) Iowa 40.

treatment, (41) 646.

weeds in, (47) Okla. 33.

seedling experiments, (41) N.J. 35,
Idaho 225, Nebr. 433, Nebr. 434;

(44) Hawaii 30, Va. 732; (45)

U.S.D.A. 530, N.Dak. 734; (46) Mo.

326; (47) Okla. 33, Iowa 734; (48)

N.Dak. 224; (49) 225, Mont. 430,

Can. 734, Idaho 736; (50) Conn.

Storrs 334, Can. 533.

seedlings, effect of length of day, (45)
631.

seedlings, growth as affected by H-ion
concentration, (43) 525.

selection experiments, (41) Ariz. 332.

silage, black, analyses, (41) Kans. 35.

silage for steers, (45) 96.

silage, preparation, (41) N.Dak. 140.

silage, studies, (41) Mo. 334.

spraying, (47) 592.

spraying with copperas and fertilizer
compounds, (41) Hawaii 138.

stem rot, notes, (45) 842.

stomatal behavior in, (49) 422.

straw, feeding value, (46) U.S.D.A.
531.

strontium in, (46) Colo. 28.

supplements as hog pasture, (42)
U.S.D.A. 373.

supplements effect on finish of steers,
(43) N.Mex. 374.

tea, feeding value, (46) U.S.D.A. 531.

thrips, effect on alfalfa seed produc-
tion, (49) 850.

Alfalfa—Continued.

- time of cutting, (44) Kans. 224; (46) Kans. 435; (49) Wash.Col. 224.
- twinning in, (41) 530.
- utilization, (46) U.S.D.A. 531.
- v. clover hay for heifers, (49) Ohio 375.
- v. Sudan grass, feeding value, (50) Kans. 68.
- value for work animals, (45) 573.
- value in rotations, (49) Nebr. 328.
- varieties, (45) Can. 824; (46) Tex. 329, Mich. 633.
- varieties—
 - behavior, (48) Guam 228.
 - for Alaska, Alaska, (41) 30, 31.
 - new, for South Dakota, (42) S.Dak. 827.
 - yields, (49) Pa. 223.
 - yields and adaptability, (48) U.S.D.A. 223.
- variety tests, (41) Mass. 35, Nev. 227, Ariz. 331, Ariz. 332, Can. 528; (42) 98, Va. 436, Minn. 731, Minn. 824, Minn. 826; (43) Nev. 229, N.Mex. 332, Can. 735, Minn. 823; (44) Hawaii 29, U.S.D.A. 136, Minn. 330, Mont. 331, Calif. 731, Oreg. 826; (45) Can. 822; (47) Minn. 130; (48) Minn. 331, Minn. 332; (49) Va. 134, Wash.Col. 224, Alaska 426, Miss. 428, Tex. 429, N.Mex. 525, Oreg. 526, Idaho 732, Can. 734; (50) U.S.D.A. 132, Mont. 134.
- vitamin A extraction from, (43) 367.
- vitamin A in, (43) 165.
- vitamin B in, (44) 261.
- water requirements, (43) Colo. 185; (50) 734, 828.
- water-soluble constituents, (48) 201.
- water-soluble vitamin in, (42) 556, 759.
- webworm, control, (46) 153.
- weed control, (45) Wis. 227.
- weevil—
 - chalcidoid parasite of, (50) 260.
 - control, (42) 159; (43) 457; (45) 662.
 - distribution, (47) Nev. 761.
 - notes, (41) Mont. 57; (43) Colo. 158, Mont. 758; (44) Oreg. 850; (45) Idaho 251, Mont. 359; (48) U.S.D.A. 52; (50) 151.
 - parasite, identity, (46) 857.
 - parasite, value, (49) Idaho 756.
 - progress report, (45) 550.
 - spraying, (44) U.S.D.A. 855.
- winter habit, (50) 333.
- winterkilling, Wis. (42) 338; (49) 631.
- winterkilling resistant strains, (45) Wis. 227.
- yield and composition, factors affecting, (50) 726.
- yield, factors affecting, (49) Mont. 430.

Alfalfa—Continued.

- yields, (41) Ariz. 332; (45) N.Dak. 225, Wis. 227; (47) Minn. 130; (48) Calif. 527.
- yields in relation to soil moisture movement, (43) N.Mex. 738.
- yields of seed, (41) Idaho 226.
- yields on irrigated wild meadows, (43) Oreg. 22.
- Alga flora of desiccated English soils, (42) 726.
- Alga flour, characteristics and detection, (41) 467.
- Algae—
 - and nitrogen-fixing bacteria, symbiosis, (49) 117.
 - carbon fixation by, (46) 824, 825.
 - chlorophyll formation in darkness, (46) 724.
 - ecological study, (45) 429.
 - feeding value, (42) 769.
 - green, nitrogen fixation by, (43) 430; (46) 723, 824, 825.
 - growth in irrigation canals, (41) 883.
 - in lakes and reservoirs, prevention, (47) 590.
 - in reservoirs, treatment, (43) 479.
 - in stored soils, vitality, (44) 520.
 - marine—
 - analyses, (47) Calif. 660.
 - as feed for horses, (43) 775.
 - cold resistance in, (42) 727.
 - fertilizing value, (42) 526.
 - intracellular acidity, (42) 25.
 - permeability, (46) 126.
 - use as fertilizers, (45) 121.
 - mucilaginous substance of, (44) 202.
 - of New Jersey soils, (43) 217.
 - photosynthesis in, (46) 824, 825.
 - red, evolution of chromatophores and chondriome in, (44) 823.
 - red, photosynthesis in, (47) 126.
 - respiration studies, (41) 524.
 - vitamin A in, (47) 662.
 - wood-penetrating, (41) 429.
- Algal cells, methods of healing in, (49) 522.
- Algaroba—
 - black spot, notes, (41) Hawaii 153.
 - culture, (44) Hawaii 44.
 - meal for pigs, (43) 70.
 - notes, (48) Guam 228.
 - seed germination tests, (47) 145, 222.
- Algeria, economic guide for, treatise, (50) 93.
- "Alimentary dystrophy," use of term, (43) 861.
- Alinement charts, use in forest mensuration, (42) 239.
- Alkali—
 - accumulations in soils, (48) Calif. 516.
 - black—
 - anhydrite as remedy for, (49) 124.
 - formation in soils, (47) Calif. 619.
 - neutralizing, (48) Calif. 515.

Alkali—Continued.

black—continued.

- soils, sulphur oxidation in, (47) 220.
- toxicity, (48) Ariz. 422.
- disease of livestock, (45) U.S.D.A. 753.
- effect on—
 - action of pectin, (46) 110.
 - brick and concrete, (47) 590.
 - calcium retention of infants, (41) 561.
 - catalase production, (44) 63.
 - cement, (43) Wyo. 789.
 - citrus groves, Calif. (42) 640, 818.
 - concrete, (44) U.S.D.A. 586; (45) 689.
 - cotton, (44) Ariz. 519.
 - Portland cement, (47) Wyo. 188.
 - vitamin B, (45) 410.
- fusions, (42) 503, (44) 310; (46) 203.
- in soils as related to crop growth, (41) 127, 622; (45) 116; (46) 512; (49) 513.
- industry, treatise, (41) 210.
- investigations, Calif. (42) 813; (48) 515.
- lakes in Texas, (43) 127; (50) 724.
- lands in Iraq, (46) 512; (47) 811.
- of soil, treatise, (44) 210.
- reclamation, (44) Ariz. 509.
- reserve of blood in avitaminosis, (50) 862.
- reserve of swine as affected by feeds, (45) Ohio 573.
- resistance of crops to, (43) Ariz. 724.
- salts—
 - antagonistic action of other salts toward, (44) 20.
 - as affected by irrigation and drainage, (49) N.Mex. 886.
 - effect on concrete, (44) 286.
 - effect on nitrification (43) 216.
 - effect on soil structure, (41) 520.
 - tolerance by plants, (42) 626.
 - toxicity, (41) 320.
 - toxicity and antagonism in soil, (49) 620.
 - toxicity as affected by manure, (41) 322.
 - toxicity, methods of determining, (43) 814.
- soil—
 - black, effect of gypsum, (48) 812.
 - black, oxidation of sulphur in, (49) 625.
 - black, treatment, (49) Calif. 320.
 - variability, (48) 717.
- soils—
 - aluminum sulphate for, (47) 27.
 - ammonia determination in, (50) 203.
 - as affected by sulphur, (41) 427; (45) 625; (50) 726.
 - as affected by sulphur and sulphuric acid, (42) Calif. 813.

Alkali—Continued.

soils—continued.

- bacteriological studies, (45) Colo. 213.
- concrete mixtures in, (43) 482.
- durability of concrete in, (48) 184.
- effect on concrete, (46) 85; (48) 884.
- gypsum for, (43) Ariz. 724.
- in humid portions of Finland, (50) 15.
- in India, formation, (44) 509.
- in India, studies, (41) 720.
- in South Africa, (43) 624.
- in the Transvaal, studies, (48) 420.
- management, (41) 624; (43) Calif. 724.
- methods of testing, (42) Utah 718.
- of Newlands project, (49) U.S.D.A. 621.
- peculiar, in Madras, (41) 127.
- reclamation, (42) Utah 813; (43) U.S.D.A. 420; (44) U.S.D.A. 419; Calif. 720; (45) 815; (47) N.Mex. 89, 123, Calif. 619; (49) U.S.D.A. 621; (50) Calif. 214.
- reclamation in Egypt and India, (43) 624.
- reclamation, treatise, (50) 321.
- solubility of anions in, (46) 421.
- solutions, effect on concrete, (42) 386.
- solutions, method of standardizing, (43) 12.
- spots, reclamation, (43) Oreg. 22.
- studies, (49) N.Mex. 513.
- tolerance of citrus seedlings, (42) 443.
- vertical movement under irrigation, (48) 422; (49) 513.
- water, effect on concrete, (44) 883.
- water for irrigation, (47) 886.
- Alkalimetry, electrometric, with platinum wire, (48) 709.
- Alkaline—
 - earths, effect on determination of reducing sugars, (49) 715.
 - earths, effect on lupines, (50) 426.
 - iodids, determination, (42) 111.
 - permanganate method, experiences with, (48) 609.
 - reserve of blood as affected by diet, (41) 765.
 - reserve of blood, effect of hemorrhage, (42) 368, 465.
 - soil reaction, effect on plants, (50) 814.
 - tides in nitrogen metabolism, (44) 764.
 - water, disintegration of concrete by, (47) 887.
- Alkalinity—
 - injury to plants, (47) Calif. 620.
 - method of stating, (41) 205.
 - of ash of foods, significance, (48) 205.
- Alkalis, new indicator for, (41) 112.
- Alkalization of infants' food, deleterious effect, (42) 256.

Alkaloid behavior in development of belladonna in darkness, (50) 223.

Alkaloids—
 analytical chemistry of, (50) 201.
 effect on *Botrytis cinerea*, (48) 241.
 extraction from viscera, (47) 483.
 formation in leaves, effect of sunlight, (50) 223.
 in plants, function, (46) 324.
 in plants, significance, (47) 31.
 microchemical tests for, (47) 108.

Allergins due to *Bacterium pullorum* and to *Bacterium sanguinarium*, (49) 886.

Allergy, relation to anaphylaxis, (41) 282.

Alligator pears, *see* Avacados.

Allium carinatum, notes, (44) Pa. 737.

Allocarya, studies, (43) 522.

Allograpta—
 obliqua, notes, (42) 854.
 spp., notes, (41) 852.

Allopulvinaria, new genus, erection, (45) 255.

Allothina nitida, *see* June beetle, green.

Allotment holdings in England, (41) 693.

Alloxysta erythrorhox, hyperparasite of aphids, (46) 463.

Alluvial soils of Fiji, (46) 316.

Almond—
 branches, development on peach trees, (42) 821.
 die-back, (46) 544.
 disease, control, (46) 850.
 disease, notes, (47) 541, 547.
 hulls, tannin content, (48) Calif. 506.
 industry in Italy and Spain, (48) U.S.D.A. 539.
 industry in Tunis, (44) 147.
 oil, sweet, sterilization for preparation of lipovaccines, (42) 707.
 oil, vitamin A in, (50) 857.
 proteins, biological value, (50) 857.
 roots as affected by copper sulphate, (44) Calif. 743.
 rootstock, identification, (49) Calif. 637.
 seedlings, tests, (44) Calif. 738.
 shot-hole, control, (42) Calif. 843.
 shot-hole, notes, (43) 243; (44) 49, 842.

Almonds—
 abnormal growth of scions, (41) 447.
 analyses, (42) Calif. 862.
 calcium in, utilization by man, (50) 764.
 chalcidid on, (45) 454.
 Cimbex quadrimaculata on, (44) 258.
 culture experiments, (48) U.S.D.A. 235; (49) N.Mex. 532.
 culture experiments at San Antonio, (47) U.S.D.A. 438.
 culture in Asia, (45) 45.
 digestibility, (50) 764.
 girdling experiments, (48) Calif. 534.
 nutritive value of proteins, (44) 461.
 pollination, Calif. (41) 148; (42) 832; (48) 447.

Almonds—Continued.

pruning studies, Calif. (42) 139; (48) 534.
 self-sterility in, (42) Calif. 832.
 spraying experiments, (49) Calif. 53.
 stocks for, (42) Calif. 833; (44) 145.
 variety tests, (43) U.S.D.A. 144.
 vitamin content, (44) 461, 765.

Aloes rust, studies, (43) 156.

Alpaca—
 domestication in Peru, (41) 869.
 hair structure, (44) 467.

Alphelinus semiflavus, bionomics, (48) 753.

Alsphila pometaria, *see* Cankerworm, fall.

Alternaria—
 atrans n.sp., description, (48) Ariz. 451.
 brassicae macrospora, notes, (44) Conn.State 150.
 brassicae, notes, (48) 741.
 grossulariae, notes, (46) 242.
 nelumbii n.sp., notes, (48) 549.
 on apples, (41) 844.
 on eggplant, (41) Fla. 543.
 on peppers, (45) Ga. 47.
 on potato, notes, (41) 347.
 on tobacco leaves, (46) 344.
 polypodii n.sp., notes, (48) 248.
 pomicola n.sp., description, (46) 243.
 solani. development, (45) 463.
 solani, notes, (42) 48, 149, Hawaii 543; (43) 154, 243; (46) 451, 845, 847; (47) S.Dak. 448, Calif. 646; (48) 348.
 solani, spores, germination, (48) N.H. 544.
 sp., notes, (43) 652; (47) 754; (49) Ga. 346.
 spores in the upper air, (49) 747.
 spp., utilization of citric acid by, (50) 630.
 tenuis, notes, (49) 548; (50) 248.
 violae, notes, (45) 851.

Altica—see also Haltica.
 spp., life history, (44) U.S.D.A. 459.

Altitude—
 determinations from barometric readings, (43) U.S.D.A. 120.
 high, adaptation of man to, (43) 564.
 relation to frost, (43) 417.

Alum soils in humid portions of Finland, (50) 15.

Aluminum—
 active—
 and H-ion concentrations in acid soil, (50) 220.
 determination in acid soils, (49) 804.
 toxic properties, (50) R.I. 16.
 as affected by nitrification and sulfofication, (46) Ohio 430.
 as factor in soil acidity, (44) 125.
 as phosphate, determination, (48) 503.
 chlorid, effect on soil permeability, (47) 20.
 compounds, effect on nutrition of man, (42) 165.

Aluminum—Continued.

- determination, (43) 202.
 - effect on corn, (44) 326; (49) 327, 519.
 - effect on superphosphates, (44) 23.
 - hydroxid, preparation, (46) 806.
 - in acid soil, (41) 214, 428.
 - in soil extracts, effect of fertilizer salts, (43) Mich. 125.
 - ions in plants, distribution, (44) 222.
 - phosphate as source of phosphorus for plants, (47) 623.
 - phosphate v. tricalcium phosphate, (48) 622.
 - rôle in nutrition of maize, (41) 820.
 - salts, effect on corn, (47) Ind. 147.
 - salts in soil, nature, (47) 122.
 - salts, toxic effect, (47) Ind. 124.
 - silicate, effect on wheat, (46) 717.
 - soil, as affected by sulfonation and nitrification, (41) 325.
 - sulphate—
 - effect on rhododendron, (48) 839.
 - use, (50) 844.
 - use in clarification of sugar solutions, (47) 112.
 - use on alkali land, (47) 27.
 - value for irrigated soils, (47) 221.
 - toxicity in acid soils, (42) 816.
 - use in dairying, (42) 377; (47) 282.
- Alundum filtering crucibles, technique, (44) 112.

Alunite—

- as source of potash, (41) 518; (42) 723.
- chemistry, (48) 121.
- fertilizing value, (46) 626.

Alysia manducator—

- life history, (45) 458.
- notes, (50) 360.
- parasite of flies, (42) 362.

Amaranthus—

- caudatus, germination as affected by nitrogenous salts, (47) 523.
- palmeri, poisonous to livestock, (44) Ariz. 581.
- retroflexus, composition, (43) 225.
- retroflexus germination, effect of temperature, (49) 522.
- seeds, analyses, (43) 225.
- viridis, use for greens, (42) 138.

Amaurogramma, new genus, erection, (42) 157.

Amblymerus sp. parasite of chrysanthemum midge, (43) U.S.D.A. 361.

Amboceptor—

- fixation reaction, use in meat analysis, (42) 315.
- production as affected by deficient nutrition, (41) 574.

Ambopogon hyperboreus—

- n.g. and n.sp., description, (41) 259.
- notes, (45) 661.

Ambrin, use in wound treatment, (41) 83.

Ameiva exul, control of insects by, (44) 651.

Amelanchier—

- micropetala potomacensis, new variety, (43) 222.

n.sp., notes, (43) 222.

Ameloctonus spp., studies, (49) 555.

American—

- agricultural organizations, directory, (44) U.S.D.A. 384.

Agriculture, Atlas, new precipitation section, (47) U.S.D.A. 414.

Association—

- for Advancement of Science, (44) 102.

for Advancement of Science, agriculture in, (46) 1.

for Advancement of Science, southwestern division, formation, (42) 699.

for Agricultural Legislation, (42) 390.

for Agricultural Legislation, study program, (43) 291.

of Agricultural College Editors, (41) 200; (42) 900; (43) 300; (47) 198; (49) 200.

of Medical Milk Commissions, (49) 175.

of Soil Survey Workers, formation, (42) 900.

of Soil Survey Workers, proceedings, (44) 300; (47) 210; (49) 616.

Cranberry Exchange, studies, (48) U.S.D.A. 789.

Engineering Standards Committee, (45) 687.

Farm Bureau Federation, formation, (42) 96.

Farm Economic Association, proceedings, (44) 196; (50) 197.

Food Research Institute, (44) 399, 900; (47) 500.

Food Research Institute, editorial, (45) 404.

Meteorological Society, formation, (41) 399; (42) 96, 400.

National Livestock Association, proceedings, (43) 171, 672; (46) 872; (48) 266; (50) 268.

Nature Study Society, proceedings, (45) 296.

Phytopathological Society, development, (42) 242.

plant pathologists, advisory board, (43) 443.

Plant Pest Committee, (41) 350.

Pomological Society, notes, (44) 399.

Record of Performance Council, report, (48) 76.

Seed Trade Association, (44) 531.

Society—

for Horticultural Science, (45) 833.

for Horticultural Science, proceedings, (50) 299,

American—Continued.

Society—Continued.

- for Testing Materials, standards, (48) 185.
- of Agricultural Engineers, proceedings, (42) 94; (44) 198; (46) 97; (48) 196; (50) 96.
- of Agronomy, proceedings, (44) 98; (48) 194.
- of Animal Production, proceedings, (47) 75, 278; (48) 398; (49) 863.

Americanization—

- field for rural church, (48) 493.
- through rural schools, (48) 599.

Amerosporium oeconomicum, notes, (48)

Del. 643.

Amid of α - δ -mannoheptonic acid, (41) 310.Amids of α -hydroxy acids, rotatory powers, (41) 310.

Amino acid—

- and carbohydrate relation in respiration of leaves, (49) 728.
- deficiency, relation to pellagra, (47) 65; (48) 865.
- excretion, (44) 763.
- in blood, variability, (43) 265.
- in feeding stuffs, (41) 367.
- new sulphur-containing, (49) 714.
- new, synthesis, (43) 111.
- nitrogen in blood, determination, (47) 410.
- nitrogen in urine, determination, (47) 410.
- nitrogen of gastric residuum, (41) 764.

Amino acids—

- acidimetric titration in presence of alcohol, (41) 113.
- action of furfural and dextrose on, (42) 210.
- and bacterial growth, (50) 769.
- basic, in Lima beans, (48) 107.
- basic, isolation, (48) 9.
- determination, (42) 612; (49) 715.
- effect on hydrolysis of starch, (43) 311; (45) 109; (46) 707, 708; (50) 611.
- effect on tubercle bacilli growth, (44) 580.
- electrometric titration, (50) 615.
- esterification, (43) 504.
- esters of, preparation, (43) 202.
- from coconut globulin, (44) 710.
- in autumn leaves, (47) Minn. 348.
- in gelatin, (44) 710.
- in globulin-albumin fraction of beef, (48) 803.
- in milk, (47) 201.
- in nutrition, (45) 864; (47) 365, 660.
- in protein of Georgia velvet bean, (43) 410.
- in proteins of mungo bean, (44) 709.
- in proteins of ragweed pollen, (44) 110.
- method of separation, (46) 802.
- methods for estimation, (44) 411.

Amino acids—Continued.

- nutritive value, (48) 557.
- of blood, relation to milk proteins, (46) 74.
- of feeds, determination, (46) 504.
- of flesh, (47) 610.
- of glycinin, (45) 713.
- retention and distribution, (47) 462.
- synthesis in animal organisms, (44) 63; (47) 563; (49) 661.
- titration applied to, (50) 802.
- utilization in bacterial nutrition, (41) 264.

Amino nitrogen, *see* Nitrogen.

Amino sugar of Chinese edible birds' nests, (46) 802.

Amitermes, new species, (43) 256.

Amitosis—

- in bone cells, types, (46) 263.
- studies, (41) 861.

Ammonia—

- absorbent power of soils for, (49) 515.
- absorption by peat, (41) 722.
- absorption from solutions of ammonium salts, (50) 722.
- accumulation in limed and unlimed soils, (44) 20.
- albuminoid, determination, (41) 204.
- biochemical oxidation, (47) 421, 622.
- by-product from sugar manufacture, (44) 128.
- catalysis and synthesis, (47) 421.
- catalysts, studies, (47) 320.
- catalytic oxidation, (43) 816.
- coke-oven, utilization of, (42) 522.
- concentration in blood, (41) 616.
- decomposition, furnace for, (43) 220.
- determination, (44) 28, 202; (46) 615.
- determination in—
 - alkali soils, (50) 203.
 - ammonium salts, (48) 502.
 - blood, (41) 413, 617; (42) 614; (47) 409.
 - muscle, (41) 616.
 - soils, (43) 211.
 - urine, (44) 804; (49) 806.
- distillation, (42) 504.
- distillation with Davisson scrubber, (43) 13.
- excretion, hourly variations, (44) 763.
- excretion in hunger osteopathy, (49) 159.
- fertilizing value, (47) S.C. 24.
- fixation by calcium sulphate, (41) 521.
- fixation by niter cake, (41) 516.
- fixation, new method, (43) 126.
- formation, relation to soil condition, (46) 812.
- from atmospheric nitrogen, (50) 722.
- in cream and butter, (48) 206.
- industrial transformation into urea, (49) 517.
- neutralization with boric acid, (47) 310.
- new reaction of, (46) 310.

Ammonia—Continued.

nitrogen—

- determination, (46) 12.
- in nitrogenous matter, determination, (48) 11.
- leaching from soils, (49) 419.
- separation from liquid manure, (43) 220.

of heated soil, action on germination and plant growth, (41) 216.

oxidation, (41) 111, 219, 815; (48) 519.

oxidation—

- catalyst for, (42) 522.
- catalytic, studies, (42) 312.
- determining efficiency, (41) 312.
- mechanism, (50) 320.
- paper on, (43) 25.

phosphoric acid, and potash, proportions for fertility, (49) Ohio 323.

prevention of volatilization by calcium chlorid, (42) 22.

process, direct synthetic, (44) 216.

production, (42) 20; (43) 220; (47) 420.

production by streptococci, (46) 274.

production from lime nitrogen, (41) 219.

production, new process, (42) 521.

recovery from fecal matter, (41) 723.

removal from urine, (45) 415.

synthesis, (41) 516, 627; (42) 219.

synthesis—

- bomb for, (42) 707.
- German process, (42) 722.
- in Great Britain, (42) 722, 814.
- purification of gases, (42) 610.
- under high pressures, (42) 428.

synthetic—

- manufacture, (45) 120.
- plants, German and American, (47) 321.
- transformation into ammonium chlorid, (41) 619.

volatilization from ammonium sulphate, (50) 722.

volatilization, prevention, (43) 628.

Ammonification—

and carbon dioxid formation, parallel, (41) 421.

as affected by—

- aluminum salts, (47) 122.
- gypsum, (49) 727.
- phosphates, (41) 721.
- potassium fertilizers, (50) 818.
- sodium salts, (41) 320.
- straw, (46) 424.
- tree products, (47) 812.
- water in soil, (47) 723.

as criterion of fertility, (41) 321.

at different soil depths, (42) 425.

effect of temperature, (50) 516.

in acid soils, (41) 319.

in bhattacha soils, (41) 812.

in soils, studies, (49) 723.

measure of antagonistic action between salts, (44) 20.

Ammonification—Continued.

of arid soils, (50) 420.

of drained marsh soil, (47) 512.

of manure in soil, (41) 20; (42) N.Y.State 325.

of Porto Rico soils, (44) 814.

relation to nitrogen removed by crops, (47) Tex. 22.

test, value, (41) Ga. 19.

Ammonium—

bicarbonate—

- action on moor soils, (46) 215.
- composition and action, (46) 820.
- fertilizing value, (44) 318; (48) 520; (49) 19.
- use and production for fertilizer, (48) 821.

carbonate—

- attraction for house fly, (48) 752.
- fertilizing value, (45) 518.
- toxicity to barley, (42) 219.
- transformation with gypsum, (46) 819.

chlorid—

- action and use, (43) 125.
- effect on soil permeability, (47) 20.
- fertilizing value, (41) 424; (42) 624; (43) 221; (44) 318, 817; (45) 330, 518; (48) 520, 820; (49) 20, 623, 825; (50) 621.
- hygroscopicity, (47) 321.
- preparation from synthetic ammonia, (41) 619.
- toxicity to barley, (42) 219.

citrate—

- neutral, behavior, (44) 801.
- neutral solution, composition and preparation, (47) 310.
- solutions, analysis, (47) 714.
- solutions, standardization, (43) Mich. 113.

compounds, nitrogen in, method of determining, (49) 717.

determination, (47) 804.

galactonate, preparation, (42) 503.

gluconate, preparation, (42) 503.

humate, action, (44) 513.

hydroxid, effect on insulin, (50) 802.

hydroxid, effect on oviposition of house fly, (47) 56.

nitrate—

- action and use, (43) 125.
- composition and action, (46) 820.
- determination, (42) 504.
- effect on cucumbers, (47) 637.
- effect on rice yields, (44) 831.
- effect on solubility of rock phosphate, (43) 427.
- fertilizing value, (41) 229, 424, 723, 815; (42) 720, 721; (43) 427, La. 627; (44) Ala.Col. 722; (45) Miss. 129, 518; (47) Mo. 141, Miss. 217; (48) 820; (50) U.S.D.A. 621.

increasing applications, tests, (48) 520.

Ammonium—Continued.

nitrate—continued.

- manufacture, (45) 120; (48) 426.
- seed treatment with, (41) 730.
- toxicity to barley, (42) 219.
- phosphate, fertilizing value, (42) 329, (50) U.S.D.A. 621.
- phosphate, toxicity to barley, (42) 219.
- phosphates, solubility equations, (43) 628.
- polysulphid solutions, fungicidal value, (44) 151; (45) 356.
- polysulphid wash, preparation and use, (41) 751.
- potassium nitrate, manufacture, (45) 120.

salts—

- action in plant physiology, (42) 219.
- ammonia determination in, (48) 502.
- as affecting plant food movement in soils, (41) 214.
- effect on calcium, (42) Calif. 811.
- fertilizing value, (44) 217.
- sodium sulphate, fertilizing value, (44) 318.

sulphate—

- action and use, (43) 125.
- analyses, (44) Ky. 516.
- and sodium ammonium sulphate, comparison, (46) 819.
- and sodium nitrate, comparison, (48) Can. 323.
- and superphosphate, fertilizing value, (48) 434.
- and superphosphate mixtures, setting of, (41) 425.
- as an insecticide, (41) 251.
- as nitrogenous fertilizer, (46) 519, 520.
- as reagent in antitoxic sera concentration, (42) 775.
- cause of caking, (43) 25.
- decomposition, (45) 726.
- effect of increasing amounts, (48) 520.
- effect of iron oxid or salt on, (42) 521.

sulphate, effect on—

- availability of iron, (46) N.J. 526.
- availability of rock phosphate, (46) Ohio 429.
- barley, (49) 631.
- cellulose decomposition, (48) 217.
- clover, (44) 815.
- composition of crops, (41) 422.
- lime requirements of soil, (44) Pa. 723.
- pineapples, (49) Guam 435.
- plants, (45) 733.
- potassium availability in green-sand, (48) 724.
- rice yields, (44) 831.
- soil acidity, (42) 623; (47) R.I. 519.

Ammonium—Continued.

sulphate, effect on—continued.

- soil reaction, (41) 319; (48) 216.
- soil solubility, (41) Mich. 512.
- soy beans, (41) N.J. 27.

sulphate—

- fertilizing value, (41) Mass. 21, 229, 516, Can. 516, N.C. 624, 723, 815, 825, 826; (42) Guam 37, 218, 521, 624, 721, Calif. 811; (43) Ala.Col. 135, 221, Wis. 336, 627, La. 627, 628, Can. 727; (44) 318, Ala.Col. 722; (45) Ala.Col. 119; (47) Ind. 139, Mich. 143, Mass. 218, 322, 419, Wash.Col. 520, 824; (48) Ga.Coastal Plain 128, 520, S.C. 621, 721, Pa. 819, 820; (49) 20, Guam 427, 623, 815, 834; (50) 423, 424.
- from refuse, (41) 723.
- herbicidal value, (47) 235.
- hygroscopicity, (47) 321.
- limits of toxicity, (41) 815; (42) 219.
- manufacture, new method, (42) 521.
- manufacture, studies, (46) 819.
- sulphate nitrate—
 - composition and action, (46) 820.
 - fertilizing value, (45) 330; (47) 322, 419; (48) 721, 820; (49) 20, 623; (50) 423.
 - hygroscopicity, (47) 321.
 - increasing applications, tests, (48) 520.
 - new fertilizer, (44) 216.
- sulphate—
 - nitrification, (43) 215; (45) 423; (46) 516.
 - nitrification, effect of lime and chalk, (49) 512.
 - nitrogen availability, (43) Ala.Col. 135.
 - preparation, (43) 126.
 - production, (42) 20; (47) 420.
 - production from gypsum, (48) 621.
 - production in 1922, (50) 122.
 - production in United States, (45) 730.
 - retail prices, (42) U.S.D.A. 331.
 - sprays, fertilizing value, (41) Hawaii 148.
 - summary, (49) 123.
 - superiority over sodium nitrate, cause, (48) Calif. 517.
 - synthetic, fertilizing value, (48) 820.
 - time of application, (44) 319.
 - toxic effect, (46) Mass. 21; (49) 517.
 - use in nematode control, (41) Fla. 548.
 - v. sodium nitrate, (42) 22.
 - washing out of nitrogen from, (45) 727.

Ammonium—Continued.

superphosphate—

- and Rhenania nitrogen phosphate, comparison, (50) 817.
- fertilizing value, (42) 329.

Ammo-phos, effect on seed germination and plant growth, (50) N.J. 215.

Amoeba meleagridis—

- notes, (43) 476, 586; (46) 687.
- studies, (41) 685.

Amorbia humerosana, notes, (46) 749.

Amorphoidea lata, notes, (49) 156.

Amphibians, internal secretions in growth and development, (45) 373.

Amphicercus bicaudatus, *see* Apple twig borer.

Amphicoma vulpina—

- control, (50) Mass. 659.
- notes, Mass. (43) 158; (47) 452.

Amphidasis cognataria, paper on, (42) 748.

Amphisphaeria cocos, notes, (47) 547.

Amphorophora sensoriata, description, (50) 454.

Amygdalin as nutrient for *Aspergillus niger*, (42) 727.

Amygdalopersica formonti n.sp., studies, (42) 820.

Amyl acetate, value against grasshoppers, (45) 151.

Amyl alcohol, recovery, (46) 808.

Amylase—

- action, effect of mercury in presence of amino acid, (48) 608.
- activation, effect of H-ion concentration, (46) 325.
- activity, effect of antiseptics, (46) 707.
- amylolytic and proteolytic activities, (42) 203.
- chemical investigation, (48) 804.
- effect of amino acids on, (42) 203.
- in calf fetus, (44) 865.
- in milk and cheese, (45) 679.
- in pollen, (48) 728.
- in potato juice, (42) 502.
- method of purifying, (42) 203.
- of fresh and dried vegetables, (41) 202.
- of *Rhizopus tritici*, (45) 144.
- pancreatic, effect of amino acids on decomposition, (50) 611.
- pancreatic, process of purifying, (44) 309.

Amylases—

- hydrolysis of starch by, factors affecting, (49) 10.
- studies, (43) 311; (45) 109; (47) 408.

Amylomucor, production of vitamins by, (48) 760.

Anabrus simplex—

- control, (49) Colo. 450.
- notes, (50) 151.

Anachaetopsis vagans n.sp., description, (48) 752.

Anaerobe jar, modification, (46) 180; (48) 203.

Anaerobes—

- biochemical changes produced by, (48) 108.

Anaerobes—Continued.

culture in Petri dishes, (46) 681.

culture, method, (44) 477; (46) 412; (47) 108.

effect of plant tissue on, (50) 879.

heat resistance, (49) 863.

in plant tissues, (48) 451.

isolation and culture, (46) 179.

isolation, principles, (46) 773.

metabolism, (50) 785.

methods of plating, (43) 227.

micro-gas analysis, (48) 311.

morphology and cultural characteristics, (45) 182.

pathogenic—

- biochemistry, (41) 476; (42) 271; (43) 880.

discussion, (45) 480.

review of literature, (50) 478.

studies, (41) 476; (43) 275.

surface cultivation, method, (47) 803.

toxin-producing, from fly larvae, (49) 255.

toxin-producing from *Lucilia caesar* larvae, (47) 258.

toxin-producing in Wisconsin, (50) 682.

Anaerobic—

bacteria and infections, (45) 579.

flora of wounds, (41) 476, 874, 876.

organisms, cultivation, new method, (42) 775.

spore test for manurial pollution of milk, (45) 73.

tube, Wright-Buchner, modification, (42) 529.

Anaerobiosis, (50) 627.

Anaerobiosis, factors affecting, (45) 279.

Anaerobiosis, securing with hydrogen, (49) 863.

Anagrus—

frequens, parasitism by, (42) 249.

giraulti, parasitism by, (44) 654.

Anagrus nigricornis, notes, (43) 662.

Analytical methods, standard, treatise, (47) 108, 801.

Anametis griseus, notes, (46) Mich. 457.

Ananaphylaxis, studies, (41) 185.

Ananas—

botanical study, (43) 837.

history of, (41) 242.

Anaphoidea conotracheli, parasitism by, (45) 361.

Anaphothrips striatus—

on corn, (43) Conn.State 252.

on tobacco, (45) 456.

Anaphylactic—

injection, immunizing action of sodium chlorid against, (41) 476.

shock, suppression, (41) 681.

Anaphylaxis—

and allied phenomena, (43) 780.

and peptone poisoning, (42) 271.

discussion, (45) 279.

in glandered horses, (41) 84.

in veterinary practice, (41) 184.

Anaphylaxis—Continued.

- parasitic, (45) 882.
- produced by milk, (42) 363, 660.
- reaction of milk proteins, (46) 9.
- review of literature, (43) 471.
- studies, (41) 185, 186, 282.

Anaplasma—

- argentinum, notes, (43) 77.
- argentinum, studies, (42) 883.
- centrale, longevity, (44) 277.
- isolation of, (43) 77.
- spp., notes, (43) 883.
- studies, (41) 875.

Anaplasmas and anaplasmosis, (43) 685.

Anaplasmosis, bovine—

- immunization, (43) 77.
- studies, (42) 883.

Anaplasms, method of staining, (44) 278.

Anarsia lineatella, *see* Peach twig moth.

Anastatus—

- bifasciatus, parasitism by, (46) 457.
- microcentri n.sp., description, (48) 59.
- semiflavus, biology and importance, (45) 457.

Anastrepha—

- acidusa, notes, (42) 152.
- bistrigata n.sp., description, (43) 258.
- fraterculus, notes, (41) 552.
- of Brazil, (41) 758; (43) 258.

Anatidae, North American, life histories, (49) 756.

Anatomy—

- dictionary of scientific terms, (45) 299.
- pathological, treatise, (44) 577.

Anatrachyntis falcata, notes, (47) 358.

Anay, description, (41) 740.

Ancyliis comptana, *see* Strawberry leaf roller.

Ancylostoma caninum—

- hemolysin from, (46) 379.
- in foxes, (46) 886.

Ancylostomiasis, rôle of pigs in spread, (48) 182.

Andes berry, value, (47) 40.

Andirobinha or mapia seeds, oil from, analyses, (47) 803.

Andrena perplexa, mouth parts, studies, (46) 560.

Andropogon—

- annulatus, analyses, (45) 376.
- faveolatus, notes, (41) Fla. 528.
- intermedius, analyses, (50) 168.
- purpureo-sericeus, value for poor land, (46) 30.

sorghum—

- culture, (42) U.S.D.A. 340.
- fertilizer experiments, (41) 814; (42) 723.
- hydrocyanic acid content, (41) 474.
- smuts, studies, (41) 51.

Anemia—

- as affected by secretin, (46) 760.
- blood regeneration following, (44) 564.
- in rats on deficient diets, (48) 362.
- infectious equine—*see also* Swamp fever.

Anemia—continued.

infectious equine—continued.

- contamination of horse sickness serum by, (44) 81.
- immunity, (43) 83.
- in U. S. Army Post, (48) 381.
- incubation period and course, (49) 787.
- notes, (43) Nev. 272.
- organism causing, (43) 82.
- pathological anatomy, (41) 480.
- relation to *Gastrophilus* larvae, (44) 280.
- studies, (43) 585, 787.
- study of long bones in, (43) 83.
- transmission, (42) 678.
- transmission to swine, (44) 185, 779.
- virus, resistance to carbolic acid, (49) 684.

infectious, iron content of blood, (50) 684.

infectious, transmission experiments with sheep, (47) 683.

progressive pernicious, of bovines, (50) 481.

studies, (50) 262.

Anemone—

- apennina, variation in, (42) 726.
- hepatica, flower variations in, (43) 328.

Anesthesia—

blood catalase before and after, (42) 259.

in treatment of botulism, (46) 64.

local, paper on, (49) 178.

use of stovaine in, (44) 476.

Anesthetics—

effect on activities of plant enzymes, (42) 129.

effect on respiration, (41) 524, 632.

effect on respiration in plants, (47) 426.

effect on respiration of laminaria, (42) 436.

resistance of protoplasm to, (44) 28.

Angitia—

- fenestralis, biology, (50) 561.
- galleriae n.sp., notes, (45) 459.

Ang-khak, Chinese, manufacture in United States, (42) 416.

Angophoras, shoot-bearing tumors, (41) 728.

Angoumois grain moth—

- as affected by humidity, (41) N.J. 58.
- notes, (42) 851; (48) 650.
- popular account, (42) 548.
- summary, U.S.D.A. (44) 354; (47) 156.

Anhydrite, use on black alkali soils, (49) 124.

Anhydrous copper sulphate and lime, fungicidal value, (49) 645.

Anicetus annulatus, notes, (43) 662.

Anilastus ebeninus, notes, (48) 158.

Anilin dye industry in Europe, feeding employees, (42) 863.

Animal—

- biology, textbook, (41) 896.
- body, chemical composition, (48) 167.
- body, oxidation and reductions in, treatise, (48) 411.
- body, symmetry relations, treatise, (42) 846.
- breeding—*see also* Breeding, Hybridization, and specific animals.
 - and feeding, treatise, (47) 865.
 - coefficient of relationship, (45) 671.
 - in Catalonia, (47) 866.
 - methods, (50) 367.
 - new standards in Germany, (49) 165.
 - problems, (43) 67.
 - progress in, (50) 467.
 - research in, (45) 369.
 - scientific principles in, (41) 267.
 - sterility in relation to, (49) Ky. 164.
- by-products, methods of preparation and manufacture, (47) Ind. 473.
- cadaver by-products, feeding value, (42) 369.
- calorimetry, studies, (47) 63; (48) 161.
- cells, analysis, (45) 732.
- cells, attempts to modify germ plasm, (47) Wis. 476.
- cells, mitochondria in, (46) 824.
- diseases—*see also* specific diseases.
 - Act in Canada, (50) 582.
 - and bacteriology, treatise, (44) 678; (49) 177.
 - and control, (43) 780.
 - caused by parasites, (49) 177.
 - chemical pathology, (45) 381.
 - clinical diagnosis, textbook, (50) 379.
 - communicable, (48) 277.
 - control, (49) 178.
 - control in Kansas, (46) 178.
 - control in Massachusetts, (46) 681.
 - control on the farm, (41) 279.
 - diagnosis, (45) 176.
 - diagnosis, preparation and shipment of specimens, (44) Kans. 373.
 - diagnosis, preparation of specimens, (47) Nebr. 786.
 - eradication, (43) U.S.D.A. 471.
 - evolution, treatise, (46) 374.
 - guide for farmer, (46) 276.
 - in Assam, (41) 874.
 - in Baluchistan, (41) 777.
 - in Bengal, (48) 579.
 - in Bombay, (50) 479.
 - in Burma, (50) 77.
 - in Canada, (42) 379; (43) 272; (45) 680; (46) 880; (47) 181; (49) 377; (50) 582.
 - in Ceylon, (41) 680; (46) 880.
 - in Denmark, (50) 479.
 - in Egypt, (44) 577; (45) 382; (46) 773; (47) 584.

Animal—Continued.

- diseases—continued.
 - in England, (41) 873; (42) 72; (45) 177; (46) 773; (49) 178.
 - in France, (45) 478; (46) 479; (48) 480.
 - in Georgia, regulations, (44) 577.
 - in Germany, (44) 577; (48) 480.
 - in Gold Coast, (49) 278.
 - in Great Britain, legislation, (44) 180.
 - in Hawaii, (45) 680; (49) 378.
 - in India, (41) 680, 777, 874; (42) 675; (43) 272; (44) 275, 476; (45) 177, 382, 881; (46) 276, 479, 480; (47) 283, 583, 878; (48) 480, 878; (50) 783.
 - in Ireland, (41) 280; (49) 278.
 - in Japan, (44) 577.
 - in Kentucky, (49) Ky. 580.
 - in Louisiana, (45) 781.
 - in Madras, (43) 180.
 - in Maine, (43) 272.
 - in Massachusetts, (41) 279.
 - in Michigan, (49) 278.
 - in Montana, (48) 877.
 - in Morocco, (45) 881.
 - in New Zealand, treatise, (50) 76.
 - in North Dakota, (43) 272.
 - in Norway, (41) 280; (50) 582.
 - in Ontario, (50) 878.
 - in Oregon, (50) 879.
 - in Paris and Department of the Seine, (41) 777.
 - in Philippines, paper on, (42) 878.
 - in Prussia, (45) 73.
 - in Punjab, (50) 480.
 - in Queensland, (41) 82.
 - in Rhodesia, (43) 780; (46) 880.
 - in Saxony, (44) 476; (46) 479; (48) 178.
 - in South Africa, (47) 283.
 - in South Carolina, (44) 180.
 - in Tasmania, (49) 179.
 - in Tennessee, (41) 680.
 - in Union of South Africa, (46) 881.
 - in Utah, (41) 82.
 - in Wyoming, (45) 177; (48) 877.
- infectious, immunity in, (44) 475.
- infectious, in Germany, (50) 182.
- infectious, in New York State, (42) 776.
- infectious, prevention and control, (50) Ohio 582.
- laboratory and field diagnosis, (49) Ky. 581.
- new surgical methods, (45) 73.
- obscure, (50) Minn. 181.
- occurrence and control, (45) 278.
- of range stock, (48) 604.
- papers on, (47) 482.
- parasitic, relation to livestock industry, (44) 180.
- prevention, (45) 881.
- quarantine, (41) U.S.D.A. 680.
- remedies, (42) Wyo. 174.

Animal—Continued.

diseases—continued.

- report of advisory committee on, (47) 678.
- research, importance to agriculture, (45) 73.
- research in South Africa, (41) 280, 474.
- textbook, (45) 176, 278; (46) 276.
- tick-borne, (45) 381.
- transmission by insects, (43) 450.
- treatise, (44) 577; (47) 283; (49) 278.
- tropical, (45) 477.
- tropical, treatise, (47) 80.
- ecology of Johnson Co., (41) Iowa 753.
- feces, detection of worm eggs in, (49) 785.
- feeding, adipo-protein ratio, (50) 267.
- feeding, lessons in, (42) 693.
- feeding, principles, (47) 70; (50) 266.
- foods and food preserves, (47) 715.
- foods, world's supply, (43) 593.
- genetics and eugenics, treatise, (47) 67.
- growth as affected by light, (50) 362.
- growth, studies, (46) 672.
- husbandry—
 - course of study, (43) 494; (45) 93.
 - exhibit, (43) Mich. 698.
 - extension round table, (49) 864.
 - in New York University, (42) 94.
 - instruction in, (49) 96.
 - laboratory exercises, (42) 298.
 - promoting research in, (47) 75.
 - teaching in war time, (47) 278.
 - teaching, problems, (49) 864.
 - textbook, (43) 494.
- industry laws in Michigan, (46) 480.
- industry, occupations in, (47) 695.
- life in deserts, treatise, (50) 355.
- life in field and garden, (48) 549.
- life in Scotland as affected by man, treatise, (45) 55.
- life in soil, control, (48) Fla. 251.
- light, nature of, treatise, (45) 550.
- motive power, (48) 198.

nutrition—

- importance of zinc in, (48) 63.
- Institute of University of Cambridge, (49) 493.
- methods of experimentation, (41) 366.
- potassium in, (49) 568.
- principles, (50) 266.
- problems, (50) 266.
- research at Rowett Institute, (50) 266.
- studies, (47) Iowa 375, Iowa 772; (48) Mo. 472, Mo. 474; (50) Minn. 175, Mo. 868.

parasites—

- and human disease, (48) 253.
- control on the farm, (41) 279.
- classification, booklet, (46) 456.
- diseases caused by, (49) 177.

Animal—Continued.

parasites—continued.

- effect on photosynthesis, (44) 518.
- eradication, therapeutic measures, (42) 674.
- external, fumigation, (41) N.Y. Cornell 82.
- in Colorado, (44) 180.
- in East Africa, (45) 656.
- intestinal, remedies, (41) 286, 480, 782.
- of domestic animals, (50) Calif. 845.
- studies, (43) Okla. 79.
- treatise, (41) 184; (45) 780; (49) 377; (50) 554.

pests—

- control, (50) Calif. 845.
- control in Oregon, (49) 756.
- in Switzerland, (49) 144.
- of farm and forest, (48) 749.
- of orchard, gardens, and ornamentals, treatise, (49) 654.
- trapping on the farm, (43) U.S.D.A. 449.

power, efficient use, (47) 90.

power on the farm, (46) 99.

production—

- balance in, (48) 398.
- course of study, (44) 194, 494.
- in France, (47) 297.
- laboratory exercises in, (44) 296.
- research, papers on, (41) 366.

products of French West Africa, (44) 267.

products statistics of Canada, (45) 295.

protein, value for laying hens, (46) 875, Ky. 875.

shelters, artificial heating, (44) 199.

shelters, heating systems for, (46) 491.

tissue, inorganic phosphorus in, (43) 116.

tissue, lead determination in, (49) 113, 114.

tissues—

- chlorin and bromin in, (44) 713.
- deproteinization, methods, (46) 564.
- fermentation-accelerating power, (47) 662.
- infiltration and preparation for microscope, (45) 599.
- inorganic iron in, distribution, (45) 10.
- iodin determination in, (44) 114.
- iron detection in, (49) 408.
- nutritive properties, (46) 161.
- oxidation of xanthin and hypoxanthin by, (48) 207.
- water content in beriberi, (47) 369.
- tropisms, treatise, (42) 846.
- waste, preparation for feeding stuffs, (43) 868.

Animals—*see also* Livestock, Cattle, Sheep, *etc.*

age in, equivalence, (48) 660; (50) Mo. 467.

anatomy and physiology, (48) 674.

and their environment, treatise, (49) 756.

Australian, in New York Zoo, (41) 55.

avitaminous, sensitiveness to poisons, (46) 470.

bacterial content of normal flesh, (44) 377.

captive wild, diseases, treatise, (50) 885.

castration, treatise, (45) 881.

dairy, food requirements, (50) Minn. 175.

dead, by-products, feeding value, (42) 369.

dead, use in fertilizer manufacture, (42) 814.

digestion experiments, errors in, (49) 865.

domestic—

anaerobic infections, (45) 480.

blood transfusion in, (49) 178.

care, treatise, (49) 377.

cod liver oil for, (50) 267.

comparative anatomy, treatise, (49) 278.

consumption of nutrients, (43) 62.

diseases of genital organs, (46) 482.

endoparasites of, (50) Minn. 152.

epidermoid carcinoma, (45) 76.

factors controlling fertility and fetal atrophy, (47) 863.

growth in, (49) 164; (50) Mo. 466.

growth rate, (48) 663.

in Italy, (49) 67.

insects attacking, (44) 57.

intersexuality in, (50) 130.

lungworms in, (47) 586.

normal blood of, (45) 884.

number of young in, (44) 174.

origin, (48) 867.

parasites of, (48) 877.

parasitic diseases of, (43) 580.

parasitic worms in, (45) 183.

pathological anatomy, treatise, (46) 681; (50) 379.

physiology, treatise, (46) 681.

regional anatomy, (41) 279; (44) 481.

relation to Anopheles, (50) 559.

variation in, (48) 165, 874.

draft, working conditions, (49) 570.

experimental, photographing, (50) 367.

farm, feeding, treatise, (46) 70.

farm work, feeding, (49) 69.

food, in United States, (48) U.S.D.A. 68.

food of, excess of fat in, (46) 565.

fur-bearing, *see* Fur-bearing animals.

Animals—Continued.

growth and reproduction, effect of organic nutrients on, (42) Wis. 371.

hybrid, sex ratio and unisexual sterility in, (48) 766.

identification by nose prints, (50) 269.

immature, breeding, effect on growth, (46) Mo. 362.

injurious and beneficial to agriculture, (42) 451.

injurious to plants, (43) 152.

insects attacking, (43) 556.

intersexual, histological study, (50) 227.

judging and selecting, formulas, (47) 68.

laboratory—

epidemics among, (49) 584.

recording blood pressure, (43) 879.

vitamin requirements, (50) Minn. 163.

large, inoculation, (48) 579.

laws regulating commerce in, (44) 836.

longevity, (44) 866.

lungs of, microorganisms in, (48) 278.

males, sterility in, (48) 399.

management, (50) 775.

marine, lunar periodicity in, (49) 115.

marine, zinc and copper in, (49) 258.

newborn, respiratory exchange in, (49) 15.

of Florida Everglades, (42) 724.

of Glacier National Park, (41) 55.

parenchymatous organs, fatty degeneration in, (47) 80.

pedigreed, registry of merit system, (47) 278.

predatory, control, (41) 353.

preparation for market, (48) 773.

production in the United States, (48) 598.

protection and introduction in Queens-land, law, (48) 549.

resistance of intracellular organisms to disinfectants, (43) 822.

ruminants, metabolism experiments, (50) 573.

slaughterhouse, parasites of, (46) 882; (49) La. 283.

small, body temperature in different parts, correlation, (50) Minn. 182.

small domestic, diseases and treatment, (50) 582.

sterility in, etiology and therapeutics, (48) 481.

synthetic Mendelian forms in, (48) 468.

types, differentiating, (49) Wis. 668.

vaccination with killed bacteria, (44) 876.

venomous, and venoms, treatise, (47) 846.

wild, conservation, (45) U.S.D.A. 754.

wild, minds and manners, (48) 549.

wild, of Louisiana, (46) 554.

Animals—Continued.

- young, diseases, treatise, (49) 782.
- young, hygiene and nutrition, (49) 772.

Anions—

- antagonistic action, (46) 126.
- effect on permeability, (47) 30.

Anipay, culture directions, (45) 35.

Anised oil, preserving value, (42) 114.

Anisopteryx sp., control by airplane, (49) 654.

Anisota senatoria, remedies, (41) 662.

Anisotylus—

- new genus, erection, (42) 656.
- n.spp., description, (42) 656.

Annatto in oils and fats, test for, (45) 508.

Annona cherimola, notes, (42) 42.

Annonas, culture experiments, (48) Hawaii 338.

Anobiidae, life history and habits, (48) 555.

Anobium—

- domesticum in New Zealand, (41) 555.
- in an old carving, (41) 847.
- punctatum, life history and control, (44) 658.
- striatum, control, (45) 656.

Anolis spp., control of insects by, (44) 651.

Anomala—

- beetle, control, (45) 551.
- beetle in Hawaii, (42) 53.
- orientalis, control, (42) 160.
- orientalis in Connecticut, (50) Conn. State 50.
- parasites in Hawaii, (42) 53.
- undulata, notes, (43) 851; (47) U.S.D.A. 157, U.S.D.A. 359.
- undulata on mangoes, (44) 554.

Anomalaphis comperei n.g. and n.sp., (43) U.S.D.A. 758.

Anopheles—see also Mosquitoes and Malaria.

- albimanus, notes, (45) V.I. 150.
- bifurcatus as affected by hydrocyanic acid, (44) 354.
- bifurcatus, infection with Plasmodium vivax, (43) 55.
- breeding among water-lettuce, (45) 256.
- (Coelodiazesis) plumbeus, breeding places and relation to malaria, (43) 55.
- crucians, agent in malaria transmission, (42) 453, 652.
- crucians, infection with plasmodium, (42) 652.
- dispersal, (50) 559.
- distribution in Bavaria, (49) 50.
- effectiveness of culicifuges against, (41) 554.
- in irrigation district, (41) 553.
- in rice fields, control, (49) 50.
- in sea water, (45) 760.
- larvae, destruction, (43) 853.
- larvae, food of, (41) 665.
- longevity, (50) 255.

Anopheles—Continued.

- ludlowi, infection with Plasmodium falciparum, (43) 854.

maculipennis—

- blood nutrition of, (43) 454, 853.
- breeding in captivity, (50) 559.
- embryological studies, (46) 459.
- oviposition, (48) Calif. 550.

occidentalis, seasonal history, (46) 856.

Panama Canal Zone species, (50) 259.

plumbeus, infection with Plasmodium falciparum, (44) 656.

plumbeus, infection with Plasmodium vivax, (41) 666; (43) 55.

relation to domestic animals, (50) 559.

relation to malaria, literature, (45) 555.

spp., American, larval characters and classification, (47) 853.

spp., in salt water, (43) 162.

spp., notes, (46) P.R. 157.

spp., number of eggs deposited by, (47) Calif. 655.

winter activities in the South, (50) 758.

Anopheline—

- larvae, new thoracic appendages in, (47) 358.

larvae, papers on, (45) 58.

mosquitoes, swarming of, (42) 751.

Sumatran, studies, (41) 460.

Anophelines—

- arsenic as larvicide, (46) 856; (49) 55.
- Californian, egg-laying, (44) 854.
- in Dutch East Indies, (41) 553.
- in England, (41) 62, 358.
- in Flanders, (44) 552.
- malarial, in California, (42) 548.
- of Denmark, (46) 459.

Anophelism and cuniculiculture, (47) 554.

Anoplaspis maskelli n.sp., description, (47) 657.

Anoplocephala mammilana, notes, (41) 287.

Anoplocurius canotiae n.g. and n.sp., description, (44) 166.

Anoplotermes, notes, (43) 256.

Anoplura in South Africa, (41) 874; (42) 155; (44) 76.

Anseres, North America, life histories, (49) 756.

Antagonism—

- and respiration in Elodea, (48) 727.

between anions, (46) 126.

between salts and alkaloids in relation to permeability, (41) 631.

studies, (46) 425.

Antestia—

- lineaticollis, life history, (44) 58; (46) 557; (48) 53.

orbitalis faceta, studies, (41) 455.

Anthela acuta, notes, (42) 751.

Anthelmintics—

- composition and therapeutic values, (45) 484; (50) 380.

- Anthelmintics**—Continued.
 experiments, (45) 73.
 experiments with fluid extracts, (43) 381.
 in gelatin capsules, tests, (42) 379.
 methods of administering, (49) 788.
 studies, (41) 480, 782; (42) 180, 379, 675; (44) 185.
 use for fowls, (46) 687.
- Antheraea**—
 cytherea droppings, analysis, (44) 420.
 spp., diseases of, (49) 154.
- Anthocyan**—
 formation at expense of preexisting glucosids, (50) 127.
 formation in plants, (48) 431; (49) 26.
 of grapes, analyses, (50) N.Y.State 410.
 physiological rôle, (47) 425; (48) 432; (50) 22.
- Anthocyanic pigments**—
 formation, (50) 224.
 in fruits, mitochondrial origin, (50) 22.
- Anthocyanidins**—
 distribution in colored plant organs, (50) 326.
 free, in fruits, (50) 127.
 free, in red flowers and leaves, (50) 127.
 in plant tissues, pseudo bases of, (50) 427.
- Anthocyanin**—
 as a microchemical reagent, (42) 229.
 formation in *Pisum*, (46) 433.
 formation, variation of organic acids during, (46) 723; (48) 222.
 in beets, (43) 132.
 localization in spring leaves, (43) 327.
 metabolism, studies, (42) 129.
 relation to respiration in leaves, (42) 129, 227.
- Anthocyanins**, studies, (41) 10, 726.
- Anthomyia**—
 redicum, *Empusa* disease in, (42) 361.
 spp., overwintering, (48) 157.
- Anthonomus**—
 cinctus, notes, (49) 255.
 grandis, *see* Cotton boll weevil.
 grandis thurberiae, distribution, (49) Ariz. 558.
 nebulosus, life history and habits, (46) 463.
 pomorum, control, (48) 753.
 pomorum, life history, (50) 458, 560.
 pomorum, notes, (42) 851.
 quadrigibbus, *see* Apple curculio.
 signatus, *see* Strawberry weevil.
- Anthostoma** cocoas, notes, (47) 547.
- Anthostomella rhizomorphae**, description, (45) 338.
- Anthoxanthins** in plants, (48) 431.
- Anthracene**—
 injurious to plants, (45) 29.
 oil treatment for root maggot, (41) 259.
 oil, use against fowl tick, (42) U.S.D.A. 253.
- Anthracnose**—
 notes, (49) Oreg. 546.
 of various plants, (46) 239.
 resistance, inheritance of, (42) 245.
 studies, (41) 543.
- Anthrax**—
 and sheep pox, vaccination, (44) 582.
 antiserum, testing, (45) 682.
 atypical form, (43) 582.
 bacilli—
 antigen of, (41) 875.
 bactericidal action of rabbit serum toward, (44) 182.
 effect of normal beef serum on, (42) 475.
 intracutaneous inoculation, (49) 881.
 killed by alcohol-ether, immunizing value, (46) 774.
 life history, (47) La. 485.
 microorganisms antagonistic to, (45) 479.
 sensitization due to, (46) 881.
 beef serum for, (46) 579.
 control, (41) 84; (43) 272; (45) 881; (49) 179.
 control in Canal Zone, (44) 877.
 cutaneous vaccination against, (44) 877; (46) 375.
 detection, precipitin reaction for, (45) 180.
 diagnosis from putrefying tissues, (44) 182.
 diagnosis, selection and shipping of material, (45) 381.
 efficacy of normal sera, (43) 181.
 equine, immunization, (50) 79.
 human, bovine serum for, (45) 683.
 human, treatment, (46) 375; (48) 279.
 immunizaion, (41) 284, 378, 576; (43) 582; (44) 578, 876.
 immunization in Algeria, (50) 182.
 immunization with oviserum, (42) 777.
 in Canada, (47) 181.
 in Great Britain, (46) 178; (50) 182.
 in Porto Rico, (45) 583.
 infection—
 and immunity, (48) 878.
 dissemination, (44) 876; (45) 679.
 portal of entry, (50) 79.
 studies, (48) 676.
 value of normal sera in, (44) 679; (48) 878.
 variations, (50) 881.
 infested skins and hair, disinfecting, (46) 480.
 lateralis, notes, (49) 657.
 notes, (41) 873; (44) 180; (46) 773; (48) 579; (49) 278; (50) 582.
 paths of infection, (50) 284.
 popular account, (44) 375.
 precipitinogen, detection of, (43) 583.
 prophylaxis in leather industry, (46) 682.
 report of hearings on, (47) 284.

Anthrax—Continued.

- resistance, effect of vitamin deficiency, (49) 279.
- review of literature, (44) 578.
- serum, standardizing, (41) 378.
- simultaneous vaccination against, (48) 277.
- spores, destruction in hides, (43) 180.
- symptomatic, *see* Blackleg.
- transmission by flies, (41) La. 461.
- transmission by insects, (49) La. 881.
- treatment, (41) 83, 189, 284, 576.
- vaccination, anaphylactic reactions from, (46) 180.
- vaccination of guinea pigs against, (47) 786.
- vaccination, persistence of vaccine, (45) 682.
- vaccine, Australian, (50) 881.

Anthrenus—

- musaeorum larvae, injury in wool warehouses, (47) 258.
- spp., control, (50) U.S.D.A. 56.

Anthrbus fasciatus, notes, (43) 252.

Anthromycopsis filiformis n.sp., notes, (50) 42.

Anthrothrips, key, (41) 847.

Antianthe expansa, notes, (49) 550.

Antibodies—

- acquired inheritance, (50) 783.
- as affected by desiccation, (41) 874.
- behavior in immune sera, (42) 73.
- essential identity of, (46) 375.
- hereditary transmission of in glanders, (42) 778.
- in glanders, studies, (41) 189.
- lens, prenatal effects, (41) 861.
- normal, in blood, (45) 680.
- production—
 - after mallein infections, (47) 383.
 - as affected by thorium X, (42) 879.
 - as affected by yeast, (41) 778.
 - by intratracheal injection of antigen, (47) 383.
 - importance of respiratory tract in, (48) 481.
 - polyvalent, (45) 780.
 - theory of, (41) 777.

Anticarsia gemmatilis, notes, (48) Fla. 251.

Antigen—

- intratracheal injection, antibody production by, (47) 383.
- of *Bacillus abortus*, preparation, (44) 480.
- of *Bacillus anthracis*, (41) 875.
- rate of absorption, relation to immunity production, (43) 381.

Antigenic—

- properties of—
 - hemoglobin, (41) 576.
 - lipins, (42) 883.
 - lipoids, (41) 477.
 - lipo-proteins, (42) 883.
 - protein fractions, (42) 883.
 - proteoses, (41) 575.
- relations of *bipolaris septicus* group, (48) 178.

Antigenic—Continued.

- specificity, relation to chemical structure, (42) 775.
- value of blackleg germ-free filtrate, (44) 76.

Antigens—

- as factors in immunization, (42) 176.
- comparison, (45) 383.
- heterogeneous, studies, (45) 680, 681.
- massive doses for tuberculosis immunity, (44) 682.
- multiple, polyvalent antibody response to, (45) 780.

Antimalarial Commission, report, (42) 158.

Antimony—

- electrode, use for titration of acids and bases, (49) 803.
- toxic action on plants, (49) 127.

Antinia theivora n.sp., description, (43) 163.

Antipneumococcic serum, immunizing power, (42) 73.

Antipyretics, studies, (43) 370.

Antipyrin distribution between water and chloroform, (47) 15.

Antirachitic substances, distribution, (50) 771.

Antirrhinum—

- spp., propagating in acid medium, (49) 836.
- wilt, notes, (50) 547.

Antirrhinums—

- and Pentstemons, handbook, (45) 838.
- culture, treatise, (43) 441.

Antiscorbutic—

- factor as affected by cooking, (41) 365.
- factor, relation to immunity production, (41) 574.
- factor, rôle in nutrition, (41) 171, 560.
- preparation, effect on guinea pigs, (48) 866.
- substance in barley, (42) 463.
- value of—

- banana, studies, (42) 257.
- beer, (41) 861.
- cabbage, (41) 167, 168.
- canned vegetables, (42) 163.
- concentrated fruit juices, (41) 470.
- dehydrated meat, (42) 760.
- dried orange juice, (41) 560.
- foods, (41) 266, 562.
- germinating barley, (41) 471.
- germinating beans, (41) 861.
- green malt, (41) 561.
- Indian dried fruits, (42) 163.
- lemon juice, (41) 860; (42) 57.
- lime juice, (41) 861; (42) 57.
- milk, (42) 162, 760.
- milk products, (41) 470.
- raw beef, (41) 861.
- vegetable juices, (41) 860.

Antiseptics—

- action in pneumococcus infection, (41) 476.

Antiseptics—Continued.

- activity in presence of serum, (41) 188.
- effect on anaerobic organisms, (41) 877.
- effect on lipase activity, (47) 803.
- flavin and triphenylmethane, (41) 474.
- H-ion concentration in testing, (42) 272.
- in treatment of wounds, comparison, (42) 272.
- new, (41) 83.
- testing, (41) 188.

Antiserum—

- preparation and distribution, (43) Nev. 272.
- specific, for infections of unknown cause, (42) 566.

Antisera—

- for agglutination tests, production, (41) 875.
- in gangrene prophylaxis, (41) 577.
- precipitating, method of obtaining, (45) 279.

Antistreptococcic dressing, studies, (50) 78.

Antitoxic sera—

- concentration, (41) 874.
- concentration, comparison of precipitating agents, (42) 775.
- preparation, (45) 280.
- standardization, methods, (42) 676.

Antitoxin—

- B. welchii*, studies, (41) 577.
- formation in horses, (48) 378.
- separation from sera, (41) 282, 283.

Antitoxins—

- association with proteins of horse serum, (43) 76.
- new preservative for, (45) 881.
- of *Bacillus botulinus*, studies, (42) 662.

Antonina australis, notes, (45) 551; (47) 253.

Ants—

- and fungi, relation, (44) 856.
- Argentina—
 - control, (41) 166; (43) U.S.D.A. 259; (45) 363; (49) La. 52.
 - control in Mississippi, (48) 59.
 - eradication, (43) 554.
 - in citrus groves, control, (46) U.S.D.A. 160.
 - in France, (44) 356; (46) 851.
 - in Mississippi, (47) 260.
 - life history, (45) 559.
 - papers on, (48) 852.
 - shelters for mealybugs made by, (47) 55.
- carpenter, injuring cedars, (41) 63.
- causing edema of eyelid, (41) 463.
- control, (48) Fla. 251, (49) Conn. State 660; (50) 50.
- control on shipboard, (48) 653.
- feeding habits, (43) 851.
- from Fiji and British Solomon Islands, (45) 258.
- house, notes, (46) 50.

Ants—Continued.

- in dwellings, control, (45) Mich. 662.
- leaf-cutting, control, (42) 160.
- leaf-cutting, injury, (47) 551.
- Macedonian, habits, (46) 560.
- Mermis parasite on, (46) 752.
- mound-building, in forest plantations, (47) 761.
- notes, (41) 354.
- of American Museum Kongo expedition, (48) 256.
- of British Solomon Islands, (42) 160; (45) 258.
- of France and Belgium, (41) 360.
- red, pupae as poultry feed, (50) 576.
- relation to other insects, (47) 357.
- studies, (50) 260.
- treatise, (45) 762; (49) 453.
- white, *see* Termites.

Anuraphis—

- bakeri*, *see* Clover aphid.
- helichrysi*, control, (46) 855.
- helichrysi*, notes, (43) 852.
- longicauda* n.sp., description, (44) 853.
- maidi-radicis*, *see* Corn root aphid.
- relation to *Aphis crataegifoliae*, (41) 851.

roseus, proposed name, (45) 254.

spp., notes, (47) Idaho 759.

viburnicola, parasite of, (48) 753.

Anuriella, new genus, erection, (47) 55.*Anychus*, new genus, erection, (42) 551.

"Aolan," new treatment for foot-and-mouth disease, (44) 878.

Apalia, culture directions, (45) 35.*Apamea nictitans americana*, notes, (45) 759.

Apanteles—

- gabrielis*, parasitism by, (43) 858.
- glomeratus*, life history notes, (43) 457.
- glomeratus*, notes, (41) 552, 757; (48) 158.
- glomeratus*, parthenogenesis in, (42) 156.
- hyphantriae*, notes, (46) 51.
- hyphantriae*, studies, (49) 555.
- iselyi* n.sp., description, (41) 261.
- melanoscelus*, introduction and establishment, (47) U.S.D.A. 58.
- melanoscelus*, life history and habits, (47) U.S.D.A. 57.
- phigaliae* n.sp., description, (41) 63.
- spp., parasitism by, (46) 457.
- stagmatophorae* n.sp., description, (41) 63.

Apate—

francisca, notes, (47) 163.

punctipennis, notes, (44) 256.

Apatela oblonga, notes, (43) Conn.State 251.*Apateticus crocatus*, life history, (48) 459.*Apatides fortis*, notes, (45) U.S.D.A. 258.*Apechoneura* n.sp., description, (43) 60.*Apera* n.spp. and n.subspp., descriptions, (42) 451.*Aperidae*, phylogeny of, (42) 451.

Aphaereta—

auripes, parasitism by, (46) U.S.D.A. 249.

cephalotes, notes, (50) 360.

cephalotes, parasite of flies, (42) 362.

Aphanurus banksi, parasitism by, (45) 663.

Aphelenchus—

cocophilus n.sp., description, (45) 752.

cocophilus n.sp. on coconut, (42) 746.

spp., notes, (46) 447; (47) 846.

Aphelininae, Japanese, species of, (45) 860.

Aphelinus—

bovelli, discovery of, (41) 462.

mali, importation into Uruguay, (47) 660.

mali, introduction into France, (46) 560; (47) 260.

mali, introduction in New Zealand, (46) 752.

mali, introduction into Uruguay, (46) 351.

Aphicide, tests, (46) Mass. 50.

Aphid—

eggs, destruction, (47) 253.

eggs, revolution of embryo, significance, (46) 154.

new gallicolous, on elm, (47) 657.

undescribed, on rice in Philippines, (45) 860.

Aphidae, parasitism among, (43) 457.

Aphididae—

alate forms in, occurrence, (49) 50.

generic classification, (43) U.S.D.A. 758.

new, from Italy, (47) 55.

notes, (45) 852.

of California, synopsis, (43) 452.

of Lahore, (41) 457.

of Malay Peninsula, (48) 357.

of Minnesota, synoptical key, (50) 755.

oriental, notes, (43) 452.

species list and food plants, (41) 456.

tribes and higher groups, (41) 57.

Aphidiinae, life history, (49) 559.

Aphidius—

granarius, parasitism by, (46) 158.

phorodontis, parasitism by, (44) Va. 756.

prunifoliae, control, (44) Va. 756.

sp., bionomics of, (43) 457.

spp., larval stages, (49) 559.

spp., parasites of, (45) 456.

Aphidozer, effectiveness, (50) 557.

Aphids—see also Anuraphis and Aphis.

affecting—

apples in British Columbia, (46) 154.

citrus, control, (42) 736.

roses, (43) Me. 159.

stone fruits, control, (47) Idaho 759.

vegetables, (41) N.J. 255.

as carriers of potato diseases, (49) 752.

cage for rearing on plants, (50) 151.

control, (42) 153; (47) Va.Truck 236, Calif. 653; (48) Del. 642.

Aphids—Continued.

control by dusting, (45) Mich. 259.

control by ladybird beetles, (41) 62.

distance of flight, (47) Me. 160.

eggs of, response to sprays, (42) 250.

feeding punctures, effect on plants, (50) Pa. 557.

food plants of, (43) Me. 160.

from oaks, (42) 155.

host plant list, (47) 361.

hyperparasites of, bionomics, (46) 463.

in Porto Rico, enemies and control, (49) 52.

life cycle, (45) 251, Me. 456.

life history and control, (44) U.S.D.A. 59.

new species, description, (47) 55.

on fruit, (50) 255.

paper on, (42) 51.

parasites of, (48) 753; (49) 559.

penetration of plant tissues and food supply, (49) 153.

pine-bark, notes, (43) Conn.State 251.

pink and green, control, (43) Va.Truck 451.

spermatogenesis, (46) 246.

studies, (49) Ohio 352.

transmitting potato mosaic, (42) 48.

Aphiochaeta fasciata, parasitism by, (45) 61.

Aphis—

adusta as carrier of mosaic, (50) 840.

avenae—

eggs, studies, (41) N.J. 253.

hatching of eggs, factors affecting, (45) 254.

in Southeast, biology of, (43) 556.

remedies, (42) 250.

studies, (41) N.Y.Cornell 849.

synonymy, (42) 452.

bakeri, notes, (42) 456.

brassicae, see Cabbage aphids.

brevis, synonymy, (41) 851.

cerasifoliae, notes, (42) 452.

crataegifoliae, synonymy, (41) 850.

cuscutae, n.sp., description, (41) 850.

gossypii, see Cotton aphid and Melon aphid.

grossulariae, probable identity with A.

viburni, (42) 546.

hiltoni n.sp., notes, (48) 53.

houghtonensis, studies, (42) 750.

maidi-radicis, see Corn root aphid.

maidis—

method of study, (46) 245.

natural control, (41) 62, 852.

notes, (44) 49; (45) V.I. 150, 152; (46) Guam 748; (47) 847; (48) 650.

parasite of, (48) 753.

transmission of sugar cane mosaic by, (49) 52.

mali, fire-blight distributor, (46) 348.

mali, studies, (42) N.Y.State 360.

malifoliae, notes, (47) Calif. 653.

malifoliae, relation to A. sorbi, (41) N.Y.Cornell 850.

Aphis—Continued.

malifoliae, studies, (44) Va. 754.
pomi, *see* Apple aphid.
pseudobrassicæ in New Jersey, (41) N.J. 255.

pseudobrassicæ, notes, (50) Conn.State 51.

rosy—

eggs of, (41) N.J. 255.
studies, (41) N.Y.Cornell 849; (43) N.Y.State 354; (44) Va. 754; (45) 254.

rumicis—

biological studies, (46) 246; (47) 55, 850; (49) 153.
in New Jersey, (41) N.J. 255.
remedies, (41) 662.
test of insecticides for, (49) U.S.D.A. 550.

setariae in South Dakota, (41) 59.

setariae, new genus for, (41) 850.

sorbi, control, (46) N.Y.State 351.

sorbi eggs, studies, (41) N.J. 253.

sorbi, studies, (41) N.Y.Cornell 849; (43) N.Y.State 354.

sorghi in Sudan, (41) 664.

spp., biology, (46) 855.

spp., remedies, (44) N.J. 349.

spp., transmission of cane mottling disease by, (48) 246.

viburni, probable identity with *A. grossulariae*, (42) 546.

woolly—*see also* Apple aphid, woolly.

control, (43) Md. 158; (44) 756; (47) 657; (49) Md. 354.

immunity of apple stocks, (49) 655.

in England, (45) 660.

in India, (45) 660.

movement from elm to apply, (49) 451.

notes, (42) 648; (47) 253; (49) 451.

on nursery stock, (41) 750.

paper on, (47) 849.

parasite, importation into Uruguay, (47) 660.

parasite, introduction into France, (47) 260.

parasite of, (46) 752.

relation to apple canker, (45) 147.

spraying experiments, (42) 740.

Aphomia gularis on stored peanuts, (42) 453.

Apthous fever, *see* Foot-and-mouth disease.

"Aphticelle," bovine, in France, (41) 878.

Aphycomorpha araucariae, notes, (43) 662.

Aphycus—

lounsburyi—

life history and introduction, (45) 360.

notes, (45) 660; (46) 53.

parasitism by, (46) 749; (47) 363, 759.

Aphycus—Continued.

lounsburyi—continued.

present status, (50) 663.

rearing, (45) 560.

spp., notes, (43) 252.

Apiaries, inspection, (41) Conn.State 158;

(43) Conn.State 251; (44) 351; (45)

Conn.State 148, 852; (47) Conn.State

155; (50) Conn.State 50.

Apiaries, inspection in Kansas, (49) 251.

Apiaries, out, management, (43) 57.

Apiculture, *see* Beekeeping.

Apion spp. on beans in Mexico, (47) 855.

Apis fasciata, notes, (49) 660.

Apis mellifica, mouth parts, studies, (46) 560.

Aplanobacter—

michiganense, notes, (47) Pa. 445.

rhizoctonia n.sp., description, (47) 751.

stewarti, studies, (45) 352.

stewarti, susceptibility of corn types to, (47) 245.

stewarti, transmission of, (50) 747.

stizolobii n.sp., description, (45) 450.

Aplastomorpha vandinei, notes, (48) 58; (49) 256.

Aplopsora, new genus, erection, (48) 845.

Apochiema rachlelae, habits, (44) 753.

Apogamy—

and hybridization in composites, (48) 729.

studies, (42) 527.

Apomorphin, use as reagent, (42) 613.

Apophallus brevis n.sp., description, (44) 158.

Apoplexy in garden plants, (43) 346.

Apotettix—

new linkages in, (46) Kans. 476.

parthenogenesis and linkage, (42) 768.

Appalachian Forest Experiment Station—

notes, (46) 900.

research projects, (50) 240.

Apparatus—

aerological, new, (43) U.S.D.A. 718.

artificial cell, (45) 628.

autoclave, modification, (46) 201.

automatic registering, for soil analyses, (46) 814.

bomb for ammonia synthesis, (42) 707.

bubbling hydrogen electrode, (47) 609.

butter hydrometer, (45) 315.

butter test bottles, description, (44) 311.

calomel electrode, design, (43) 204.

calorimeter, (41) 503.

check valve, (48) 709.

Clark hydrogen electrode, (47) 609.

color comparator, (45) 314.

colorimeter, description, (48) 411, 502.

comparator, double-wedge, (45) 411.

comparator, improved, (43) 503.

condensers, types, (43) 112.

condensing, (41) 311, 615.

connecting bulb, (42) 802.

continuous filters for using Norit, (44) 808.

Apparatus—Continued.

drying, (41) 311, 557, 651.
 electric oven tests, (45) 313.
 electrolytic hydrogen generator, (42) 312.
 electrolytic, platinum substitute for, (41) 204.
 electrometric titration, (41) 503, 711, 765.
 electrotitration, for determining H-ion concentration, (47) 204.
 extraction, new, description, (43) 413.
 fat-extraction, (41) 113.
 fermentation tube, modified, (43) 611.
 filtration, for use with membrane filters, (48) 502.
 for alkali fusions, (42) 503.
 for alpha-naphthol test for sucrose, (50) 11.
 for ammonia distillation, (42) 504.
 for anaerobic culture, description, (46) 180.
 for analyzing gases, (42) 611.
 for calibrating Babcock bottle, (44) 805.
 for calibrating gas meters, (44) 202.
 for catalytic hydrogenation of oils, (50) 309.
 for centrifugalization at low temperatures, (42) 312.
 for changing chamber temperature, (44) 322.
 for collecting and weighing carbon dioxide, (46) 672.
 for color measurement, (46) 111.
 for continuous dialysis, (44) 610.
 for continuous extraction of phosphoric acid, (42) 125.
 for converting gas chain voltage into C_H or pH values, (45) 803.
 for counting bacteria in milk, (45) 175.
 for demonstrating absorption of oxygen, (46) 432.
 for determining—
 alcohol, (43) 712.
 ammonia, (43) 212.
 ammonia nitrogen, (46) 12.
 amount and temperature of evaporation, (43) 16.
 arginin, (43) 615.
 arginin nitrogen, (42) 711.
 basal metabolism, (46) 671.
 bromin in brines, (42) 9.
 carbon dioxide, (41) 206; (42) 9, 412; (44) 204; (45) 627.
 carbon monoxid, (41) 312.
 catalase, (46) 503.
 catalase in milk, (45) 315.
 cellulose, (42) 612.
 composition of air, (44) 16.
 concentration of hydrocyanic acid gas, (47) N.J. 52.
 consistency of concrete, (43) 86.
 curd and fat in butter, (48) 807.
 density of molasses, (43) 806.
 dissolved carbon dioxide, (49) 505.
 dissolved oxygen, (50) 201.

Apparatus—Continued.

for determining—continued.
 errors of saccharimeter scales, (44) 13.
 free and combined CO_2 in mine water, (46) 805.
 H-ion concentration, (42) 229, 313, 411; (47) 109, 204; (49) N.Y.Cornell 712.
 leaf temperature, (41) 222; (44) 131.
 melting points, (42) 503; (43) 12; (46) 13.
 moisture content of cereals, (44) 504.
 moisture in fertilizers, (44) 802.
 nitrogen, (42) 313; (47) 309, 503.
 opacity of liquids, (46) 111.
 oxygen absorption, (48) 859.
 respiratory exchange in man, (46) 166.
 small quantities of gas, (43) 611.
 speed of percolation of water in soils, (42) 119.
 standard turbidity, (43) 614.
 sugars, (44) 204.
 urea in blood, (45) 415.
 velocity of evaporation, (42) 513.
 for dispensing concentrated sulphuric acid and sodium hydroxid, (49) 504.
 for distilling foaming liquids, (44) 10.
 for distilling liquids, (41) 311, 615; (46) 111, 414.
 for electrical treatment of milk, (43) 778.
 for electrometric titration of plant juices, (42) 505.
 for electrometric titration of sugars, (49) 203.
 for examining stomach contents, (42) 316.
 for extraction of liquids, (44) 10.
 for extraction of soluble material in soils, (42) 216.
 for fat extraction, (42) 207.
 for filtering with parchment membrane, (42) 411.
 for fractional distillation, (46) 414.
 for gas analysis, (41) 563; (44) 202.
 for gastric analysis, rapid, (42) 11.
 for heating serum, (45) 682.
 for hydrogen preparation and testing, (42) 8.
 for hydrogenation of oils, (43) 416.
 for maintaining constant humidity, (44) 55.
 for measuring—
 basal metabolism, (44) 264; (45) 66.
 bodily comfort, (44) U.S.D.A. 416.
 carbon dioxide, (41) 524; (47) 212; (48) 124.
 color in flowers, (44) 135.
 color in sugar, (44) 807.
 earth pressure, (41) 582, 790.
 heat penetration in canning, (41) 14.

Apparatus—Continued.

- for measuring—continued.
 - losses by transpiration, (47) Calif. 628.
 - oxidase and catalase activity, (42) 412; (44) 29.
 - plant growth, (43) 32.
 - pressures in soils, (44) U.S.D.A. 189.
 - radioactivity of fertilizers, (49) 217.
 - relation between wind and evaporation, (43) 16.
 - respiration of cranberries, (44) Mass. 802.
 - respiratory exchange in newborn animals, (49) 14.
 - shortening value, (46) 258.
 - sterile liquids, (45) 11.
 - tractive effort, (46) 585.
 - water, (42) 81.
 - wear of concrete, (42) U.S.D.A. 83.
- for microtitration of arsenic, (42) 206.
- for modulus of rupture tests, (50) 809.
- for motor truck impact tests, (41) U.S.D.A. 689.
- for nitrogen generation, (42) 205.
- for plant growth in sterile soil, (43) 422.
- for plant transpiration, studies, (41) U.S.D.A. 725.
- for preparing absolute alcohol, (49) 114.
- for preventing overtitration, (42) 313; (44) 10.
- for preventing superheating in moisture tester, (46) 414.
- for producing negative pressure in transpiring plants, (42) 334.
- for purifying benzoic acid, (42) 611.
- for recording growth of tree trunks, (45) 333.
- for recording plant movements, (41) 724.
- for recording weight variations in beehives, (43) Okla. 58.
- for reducing milk and fruit juices to powder, (46) 11.
- for refluxing and stirring chemicals, (44) 802.
- for separating sand and clay, (50) 14.
- for soil acidimetry, (43) 612.
- for soil analysis, (41) 621; (42) 119; (50) 809.
- for sterilization of canned foods, (44) 462.
- for sterilization of growing plants, (42) 25.
- for study of wood vessels, (41) 726.
- for studying relations of temperature to growth, (45) 526.
- for sugar analysis, (42) 211.
- for testing aggregates, (41) U.S.D.A. 688.

Apparatus—Continued.

- for testing gelatin. (49) 879.
- for testing penetrability of filter paper, (47) 506.
- for testing road materials, (41) 788, 789.
- for titration of acids and bases, (49) 803.
- for treating bulbs with hot water, (44) 451.
- for ultrafiltration, (44) 410; (50) 612.
- gasometric burette, (42) 109.
- Haldane gas analysis, improved, (46) 201.
- hydrogen electrode, (41) 503; (42) 412; (45) 715.
- hydrogen generator, description, (47) 713.
- inoculation chamber, (43) 444.
- internally heated vacuum pan, (48) 709.
- lixiviator, description, (46) 23.
- microcolorimeter and nephelometer, (44) 711.
- microcolorimeter, new, (46) 805.
- Mohr pipette, use, (48) 411.
- Murneck pressure, (50) 441, 541.
- nephelometer, (45) 412; (50) 312.
- oil hydrogenation, (41) 805.
- paint plastometer, (42) 890.
- photometer, types, (45) 503.
- piston cylinder, (46) 631.
- Plauson ultrafilter, (47) 206.
- pollination, for sugar cane, (46) 135.
- pursuit pendulum and meter, (43) 266.
- respiration chamber for large animals, (43) 266; (44) 5.
- respiration, description, (44) 172.
- respiration, portable, (42) 62.
- root auxanometer, (45) 221.
- rotary digester for testing bagasse, (46) 15.
- scientific, testing and patenting, (44) 849.
- sodium lamp, new type, (46) 111.
- soil elutriator; description, (43) 210.
- spore-trap, (41) 153.
- thermocouple, improvements, (44) 10.
- thermoregulator, description, (42) 411.
- "thermos" flask, uses, (46) 614.
- torsion viscosimeter, (44) 677.
- trap to prevent loss of iodine, (46) 805.
- turbidimeter, photometric, (43) 413.
- used in highway research projects, (50) 386.
- used in testing yarns and fabrics, (50) 234.
- viscometer, (49) 110.
- wash bottle with continuous stream, (44) 111.
- weighing burette, (41) 311.
- Zuntz-Geppert, for respiration experiments, (49) 863.

Apple—

- and plum case bearer, control, (48) 751.
- and thorn skeletonizer—
 - notes, Conn.State, (45) 149; (49) 556.
 - rapid spread of, (47) Conn.State 156; (49) 356.
 - summary, (41) 160.
- anthracnose, control, (42) 739, 740; (45) 849; (46) 47, 144, 552; (47) 248; (49) Oreg. 538, West.Wash. 845.
- anthracnose, notes, (41) 53.
- aphid eggs, N.J., (41) 253; (42) 849.
- aphid eggs, washes for killing, (50) 557.
- aphids—
 - biology, (46) 855.
 - control, (41) 662; (42) 250; (44) N.J. 349; (46) 154; (47) N.Y.State 455, Calif. 653.
 - development, factors affecting, (49) 353.
 - notes, (41) N.Y.Corned 849; (44) Oreg. 851.
 - relation to abnormal structure of apples, (43) N.Y.State 354.
- aphis, green—
 - control, N.Y.State (42) 360; (46) 351.
 - dusting for, (43) 451.
 - life history and control, (44) U.S.D.A. 59.
 - resistance of apple stocks to, (50) 845.
- aphis, rosy—*see also* Aphis, rosy.
 - control, (46) N.Y.State 351; (47) Calif. 653.
 - life history and control, (44) U.S.D.A. 59.
 - studies, (44) Va. 754.
- aphis, woolly—*see also* Aphis, woolly.
 - control, (45) 659; (46) 852.
 - habits in Virginia, (49) 451.
 - notes, (42) 450; (47) 253.
 - on nursery stock, (41) 750.
 - parasite, importation into Uruguay, (47) 660.
 - parasite, introduction into France, (47) 260.
 - parasites of, (46) 351, 560.
 - spraying experiments, (42) 740.
- bark canker disease, (49) 44.
- bark, oxidase activity as affected by salts, (44) 426.
- beverage, preparation, (49) Calif. 412.
- bitter pit, cause, (43) 847; (50) 450.
- bitter pit, control, (44) Wash. 246; (48) 456.
- bitter pit, factors affecting, (46) 47.
- bitter pit, notes, (42) 48; (50) 546.
- bitter rot canker, studies, (46) 148.
- bitter rot, control, (45) Va. 138; (47) 48.
- bitter rot, notes, (43) 155; (46) 741.

Apple—Continued.

- black rot, control, Pa. (47) 445; (50) 445.
- black rot, notes, (44) 48; (46) 849.
- black spot—
 - control, (42) 645, 741; (48) 50; (49) 546.
 - notes, (43) 155; (45) 849.
 - treatment, (41) 249, 657.
 - winter spore form, (47) 649.
- blight, American, notes, (42) 450.
- blight, history, (45) 849.
- blight, notes, (41) Mo. 650; (46) Mont. 651.
- blight resistant varieties, (41) S.Dak. 238; (48) 637.
- blister canker, control, (44) Ill. 839; (45) N.Y.State 652; (46) 47, N.Y.State 348; (47) Ill. 449, Iowa 753, Ill. 838.
- blister canker, studies, (41) 347; (44) Iowa 449, 847.
- blossom weevil, control, (48) 753; (50) 560.
- blossom weevil, life history, (50) 458, 560.
- blotch—
 - canker, origin, (50) 249, 750.
 - canker, studies, (46) 148.
 - control, (41) Ill. 146, 750; (42) Ohio 450; (43) Ind. 345, 348, 847; (44) 53, Ohio 151, 543, 648, Ill. 839; (47) 48, Pa. 445; (49) Ohio 338, Okla. 445, Ind. 545; (50) 249.
 - effect of dormant lime sulphur, (45) 750.
 - in Ohio, (41) Ohio 249.
 - infection by, (49) Ind. 538.
 - notes, (44) Pa. 745; (46) 543; (47) Ind. 147.
 - summary, (49) Ind. 754.
 - time of infection, (50) Pa. 445.
- blue mold, notes, (49) 49.
- borers, control, Pa. (43) 554; (44) 757.
- Botrytis, new species, (42) 353; (43) 244.
- bracket fungus, notes, (44) 48.
- bread, digestibility and food value, (43) 64.
- brown bark spot, (47) Mont. 843.
- brown heart, cause, (50) 449.
- brown rot fungus, production of conidia, (45) 146.
- brown rot, notes, (41) 53; (43) 45, 246; (44) 346; (45) 48, 53.
- bud aphis, notes, (49) Iowa 757.
- bud moth, new, in Pennsylvania, (49) 656.
- bud moths, notes, (41) 61; (46) 749.
- bud weevil, notes, (49) 255.
- bug, green, remedies, (41) 341.
- butter substitutes, food value, (44) N.Dak. 360.

Apple—Continued.

- by-products as stock foods, (49) U.S.D.A. 675.
- candy, (45) Utah 112.
- canker—
 - control, (41) Iowa 238, Mo. 657; (46) 551; (49) 48.
 - due to *Cytospora*, (41) Ill. 156.
 - European, control, (49) Oreg. 539.
 - European, in Oregon, (50) 148.
 - European, in Pacific States, (50) 750.
 - European, notes, (44) Pa. 745.
 - notes, (41) 53; (42) 450; (43) 45, 246, N.Mex. 345; (44) Conn. State 149, Ohio 151, Kans. 242, 346; (46) 741; (47) Calif. 649, 839, 843; (48) 146, 548; (49) 44.
 - organism, culture, (45) 147.
 - Valsa, in New Mexico, studies, (48) 646.
- cankerworm, control measures, (42) 639.
- collar rot, cause, (46) 745.
- collar rot, notes, (44) Del. 444, Ill. 839.
- core rot, notes, (47) 545.
- cork disease, cause, (46) 452.
- crinkle, notes, (43) 448.
- crosses, Oldenburg as ovule parent, (50) 834.
- crown gall, control, (47) Iowa 749.
- crown gall, notes, (41) Iowa 238, 249, 348; (42) 645; (44) 444, 449; (46) 543; (49) Iowa 747.
- crown gall on nursery stock, (41) 545, 750.
- curculio, control, (41) Ill. 146; (43) Ind. 338.
- curculio, notes, (48) 52.
- cuttings, stimulation of bud growth, (49) 834.
- datanas, remedies, (41) 662.
- deep scald, notes, (50) 450.
- die-back, cause, (50) 449.
- die-back, notes, (44) 49.
- diseases, (42) 150, 541; (45) 842; (46) 447; (48) Can. 144.
- diseases—
 - and pests, remedies, (45) Wash. 44.
 - control, (43) 544, 743, Ill. 847; (47) Minn. 348, 545.
 - in Georgia, (41) 549.
 - in storage, (44) U.S.D.A. 247.
 - nonparasitic, (50) 449.
 - notes, (41) 154; (42) N.Y.State 349; (44) 155.
 - parasitic, 1915–1920, (49) 445.
 - physiological, (44) Oreg. 840.
 - spray schedule, (42) Wash. 836.
- drought spot and related diseases, (46) 452.
- fire blight, control, (46) 451.
- fire blight, notes, (43) 656; (49) 442, 445.

Apple—Continued.

- fire blight, spraying tests, (42) 746.
- flea weevil, outbreak, (49) 855.
- foliage, injury from sprays, (47) Mass. 646.
- frog-eye, control, (44) Pa. 53.
- fruit—
 - buds, production and growth, (48) 137.
 - spot, new, (49) Ohio 648.
 - spot, notes, (44) Pa. 745; (49) 442.
 - spur, structure, (43) N.H. 44.
 - spur, studies, (44) Oreg. 835; (45) 836.
 - worms, control, (44) Oreg. 851.
 - worms in Nova Scotia, (41) 357.
- fungus diseases, treatment, (43) 155.
- glassy disease, notes, (43) 45; (45) 48.
- grading, relation to insect injuries, (45) N.Y.State 455.
- grain aphid, life history and control, (44) U.S.D.A. 59.
- grain aphid, studies, (42) 452.
- industry in United States, (41) 444, U.S.D.A. 650.
- industry of Mount Etna region, (50) 342.
- industry of North America, treatise, (45) 741.
- industry of Pennsylvania, (48) 736.
- insects, control, (50) N.Y.State 555.
- juice—
 - clarification, (46) U.S.D.A. 617.
 - concentrated, antiscorbutic property, (41) 470.
 - detection in fruit preserves, (47) 807.
 - relation of fermentation of nitrogenous matter, (43) 807.
 - unfermented, farm manufacture, (47) U.S.D.A. 508.
 - unfermented, manufacture, (43) Calif. 717.
- June drop, cause, (43) Wash. 743.
- leaf crumpler as pest of *Cotoneaster*, (45) 255.
- leaf miner, life history and control, (42) 650.
- leaf roller—
 - control, (44) Oreg. 851; (49) Pa. 251; (50) 257.
 - notes, (43) Mont. 758.
 - two-banded, notes, (44) 656.
- leaf rollers, (46) 749.
- leaf scab, notes, (42) 645.
- leaf skeletonizer, (44) Kans. 249.
- leaf spot, notes, (42) 742; (45) 849.
- leaf suckers, summary, (45) 860.
- leaf tissue, catalase activity in, (49) N.Y.Cornell 28.
- leaf trumpet miner, control, (45) N.H. 156.
- leafhopper—
 - Australian, notes, (48) 457.
 - cause of tipburn, (46) 549, 744.
 - control, (48) N.J. 354; (49) 654.

Apple—Continued.

leafhopper—continued.

- fire blight distributor, (46) 348.
- notes, (46) 51; (47) 54, 759, Mich. 759, N.Y.Cornell 848; (48) U.S.D.A. 52.
- on beans, (47) Fla. 758.
- on potatoes, (44) N.Y.State 352; (47) Iowa 756.
- studies, (41) N.Y.State 252, 848; (42) U.S.D.A. 358.

leaves as index to internal condition of tree, (44) Oreg. 835.

maggot—

- control, (42) 52, 251; (43) N.Y.Cornell 455; (44) 552; (49) N.H. 352; (50) Minn. 152.
- in Minnesota, (45) 857.
- notes, (41) 341, 354; (50) 353.
- parasite of, (45) 361.
- summary, (49) Me. 657.

mealybug, notes, (41) 757.

measles, studies, N.Mex. (47) 444; (49) 546.

mildew—

- control, (48) 827.
- downy, control, (46) 646.
- notes, (43) 246; (44) 346, 445; (45) 48; (46) 741.
- powdery, control, (41) 153, 249, 657; (42) 645; (43) U.S.D.A. 549; (46) 144.
- powdery, in South Africa, (46) 453.
- powdery, notes, (42) 742; (47) N.Mex. 444.

moldy core and rot, notes, (43) 155.

Monilia, notes, (42) 150.

nursery stock. control of woolly aphid in, (49) 451.

nursery stock. leafhoppers affecting, (42) U.S.D.A. 358.

oil, notes, (43) 712.

orchard survey, (43) Colo. 144.

orchards—

- costs and profits, (41) 835; (42) 639.
- culture experiments, (44) Pa. 741.
- decade records, (41) Ohio 239.
- fertilization, N.Y.State (49) 534, 535.
- management, (41) N.H. 43, Iowa 237, 341; (43) Ohio 340, Pa. 538; (47) Ind. 138; (49) Ind. 531; (50) Mass. 642.
- planting and care, (50) 541.
- sweet clover for, (42) Minn. 834.

Ozark Mountain measles, (43) N.Mex. 345.

pectin extracts, homemade, use, (49) U.S.D.A. 114.

pectin pulp, analyses and manufacture, (49) U.S.D.A. 675.

Phytophthora rot, (44) 648.

pollen and pistils, studies, (46) 433.

pollen germination studies, (49) 437.

Apple—Continued.

pollen, viability and potency, (46) 39.

pomace—

analyses and manufacture, (49) U.S.D.A. 675.

dried, composition and digestibility, (47) Mass. 272.

dried, digestibility, (50) Mass. 168.

use in feeding, (41) 367.

red bugs, *see* *Lygidea mendax* and *Heterocordylus malinus*.

refuse in soil, effect on nitrogen fixation, (49) 18.

root—

borer, control, (48) 555.

borer, notes, (47) 761.

fungus, notes, (43) 155.

rot, control, (44) Va. 746.

rot, notes, (42) Va. 447, 645, 739; (44) 445, 642; (45) 48; (46) 543; (49) 445.

stocks, susceptibility to black root rot, (50) 750.

weevil, notes, (42) 855.

roots, resistance to freezing, (44) N.Y.Cornell 820.

roots, winter injury, (47) N.H. 450, Nebr. 731; (49) N.H. 327.

rosette, cause, (50) 449.

rosette, factors affecting, (45) Wash. 249.

rosette, notes, Wash.Col. (49) 248, 755.

rot organism, studies, (41) 844.

rots in cold storage, control, (43) Iowa 38.

rust—

control, (42) 645; (46) 451; (47) Pa. 445.

notes, (41) Iowa 245; (46) 543; (49) 442.

relation to cedar trees, (42) 746.

studies, (41) W.Va. 53.

survey in Virginia, (46) 243.

sap, freezing-point depression, (44) N.Y.Cornell 821.

sauce, dried, (45) Mo. 209.

scab—

- control, (41) Ill. 146, 340, 348, 658; (42) 643, 739, 740; (43) Ind. 338, 743; (45) Va. 138, 146, Wis. 243; (47) Ind. 139, 242, 355, Mich. 440, Wis. 446, Mich. 449; (48) Mo. 635, 848, Mass. 848; (49) 44, Mich. 48, Ohio 338, N.H. 350, Ind. 531, Wis. 644; (50) 353, Pa. 446, 552, Mass. 655.

control in Wisconsin, (50) 750.

notes, (43) Okla. 44, 45, 243, 246; (44) 48, Mich. 144, 155, Oreg. 160, Wis. 241, 246, 346, Mich. 543, Minn. 753, 848; (45) 48; (46) 243, 543, 552, 741; (48) 242, Mass. 643; (49) 442, 445.

overwintering, (41) 450.

Apple—Continued.

scab—continued.

- prevention, (47) 545.
- spraying experiments, (42) 740, 746.
- studies, (41) 655.
- time for spraying, (47) 49.

scald—

- cause and prevention, (46) 149.
- control, (43) Iowa 38; (44) U.S.D.A. 247; (50) U.S.D.A. 552, 750, 841.
- development, (50) 541.
- nature and control, (42) 343.
- notes, (49) 49.

Sclerotium disease, (48) 741.

season, northwestern, (49) U.S.D.A. 90.

seedlings, effect of parentage, (49) Idaho 739, Iowa 740.

seedlings, root hardiness, (44) Wis. 242.

seeds, afterripening and germination, (49) 27.

seeds, respiration, (48) 624.

shoots—

- hardiness, relation to pentosan content, (46) 443.
- response to ringing and defoliation, (50) 299.
- summer growth, (50) Oreg. 741.

silver-leaf, inoculation experiments, (42) 846.

silver-leaf, notes, (41) 750; (49) 845.

sirup, keeping quality, tests, (43) Wash. 715.

sirup, recipe, (43) 808.

sirups, home manufacture, (44) Idaho 15.

sooty blotch, (46) 552.

spot disease, studies, (41) 844; (43) Ky. 847.

spur growth, studies, (44) Wis. 41.

spurs—

- analyses, (46) Mo. 335.
- blooming performance, (49) N.H. 336.
- composition, (47) 223.
- composition, seasonal changes in, (45) Mo. 123.
- nitrogenous content, factors affecting, (47) Mo. 142.
- relation to carbohydrates and nitrogen, (45) Oreg. 236.

stem end rot, description, (47) 843.

stocks, resistance to woolly aphid, (49) 655.

storage house, description, (49) Mich. 890.

sucker—

- adult habits, (48) 356.
- anatomy of head and mouth, (42) 452.
- control, (49) 758.
- European, studies, (49) 850.
- fungus parasite of, (48) 750.
- in Nova Scotia, control, (43) 850; (47) 656.

Apple—Continued.

sucker—continued.

- morphology and synonymy, (50) 844.
- notes, (41) 755; (49) 758, 850.
- quarantine, (44) 353.
- review of literature, (47) 55.
- summary, (45) 860; (49) 153.

survey in New Jersey, (43) 835.

thrips injury, (46) 657.

tissue, darkening, (50) Calif. 409.

tree borer—

- flat-headed, notes, (44) Oreg. 850.
- flat-headed, summary of information, (42) 56.

flat-headed, western species, (41) 758.

round-headed, life history and control, (43) U.S.D.A. 760.

spotted, studies, (44) U.S.D.A. 165.

tree crotch, histological studies and practical considerations, (49) N.Y. Cornell 639.

tree type, relation to productivity, (48) Me. 536.

tree weevil, bronze, notes, (42) 751.

tree wood, sulphur in, (48) Mo. 635.

trees—

- age at time of planting, N.Y.State (50) 539.

bracing, (46) Ohio 736.

bridge-grafting, (43) Conn.State 237.

cauliflory in, (42) 353.

composition, effect of shading and ringing, (49) N.H. 741.

depth of planting studies, (46) 735.

development, correlations, (48) 536.

distribution of food materials, (43) N.H. 28.

dwarf, value, (44) Va. 739.

effect of fertilizers on, (49) 617.

effect of sod in relation to moisture and nitrates, (49) N.Y.Cornell 235.

girdling by mice, prevention, (43) Conn.State 237.

girdling experiments, (48) Calif. 534.

interior and outer, comparative growth, (48) 138.

length of life, (48) 237.

length of life in West Virginia, (47) 745.

nitrogen reserve in, (48) 137.

nonproducing, in France, (46) 139.

one-year, varietal differences, (50) 341.

responses to nitrogen applications, (47) Mo. 141.

root development, (46) 38.

size differences, cause and permanence, (50) Me. 37.

Apple—Continued.

trees—continued.

treatise, (46) 735.

young nursery, carbohydrate reserves as affected by winter storage, (49) 138.

young, pruning, (50) Ind. 341.

twig borer, notes, (42) 152.

water core, control, (44) Wash. 246.

water core, notes, (42) 48.

wood, analyses, (47) 223.

worm, amount of arsenic for, (49) 656.

Apples—

abnormal structure, (43) N.Y.State 354.

abscission phenomena, (43) 539.

air-cooled storages for, (49) Mich. 889.

American, marketing in Great Britain, (48) U.S.D.A. 536.

and vegetable marrows, recipes, (46) 258.

antiscorbutic value, (45) 466.

apical browning, (49) 45.

as affected by dormant pruning, (44) 533.

as affected by freeze, (48) N.J. 339.

as affected by grass, (43) 237.

bearing habit, (50) 340.

bearing habit, relation to plant food, (45) Del. 639.

biennial bearing, (44) Wis. 41; (45) 238, 640.

biennial bearing, change of year, (46) 735.

blooming data in Nova Scotia, (47) 642.

blooming dates, (42) N.J. 835.

blossoming habit as affected by fertilizers, (43) Oreg. 145.

blossoming period, (43) U.S.D.A. 437.

blossoming, relation to temperature, (48) Mo. 443.

boxed, marketing, (50) 393.

breeding experiments, (41) S.Dak. 238; (43) Md. 143, Pa. 539, 645, 742;

(44) 145, Oreg. 836; (45) Idaho 235, 640; (46) 39; (47) 238, Minn. 338, 340, 341, Iowa 741, 744; (49)

S.Dak. 533; (50) 37, Minn. 140.

breeding for Canadian prairies, (43) 540.

breeding for late blooming, (41) Mo. 648.

bud formation as affected by soil management, (42) 535.

bud selection, (41) Mo. 648, Ill. 835; (43) 536, 744; (45) Mo. 135; (48) Mich. 237, 637; (49) N.Y.State 38.

calyx spray, formula, (49) Conn. State 742.

canned in enameled cans; varying amounts of oxygen in, (49) 856.

canned juices, for jelly making, (47) Calif. 614.

canned, pinholing in, (41) 715.

casual variability in yields, (42) Calif. 819.

Apples—Continued.

cider and vinegar qualities, (42) Minn. 316.

cider, from various soils, analyses, (41) 738.

cider, of France, origin, (45) 538.

cold storage—

decay in, (46) 544.

effect of handling, (43) 39.

effect of temperature changes, (43) Iowa 38.

holdings, (49) U.S.D.A. 893.

reports, (41) U.S.D.A. 66.

tests, (47) Iowa 741.

color and size, factors affecting, (43) Pa. 539.

color as affected by nitrate, (43) Oreg. 145.

commercial, improvement in Vermont, (45) 641.

commercial utilization and conservation, (42) 615.

compatibility of stock and scion, (47) Iowa 741.

copper injury, (50) 449.

cost of—

dehydrating, (48) Calif. 506.

production, (46) 139.

production in Illinois, (41) 341.

production in New York, (43) U.S. D.A. 649.

production in Ontario, (45) 694.

cover crops for, (49) Mont. 136.

crab, see Crab apples.

cull, use for, (45) Utah 112.

culture—

at high altitudes, (44) Colo. 234.

experiments, Alaska (41) 40, 41;

(44) 336; (47) 534; (49) 435.

experiments in Arizona, (50) U.S. D.A. 138.

in Asia, (45) 45.

in Minnesota, (41) Minn. 387.

in New Hampshire, (43) 237.

in Ozarks, (45) 835.

custard, see Custard apples.

damage from various causes, (44) U.S.D.A. 118.

Delicious, bearing habits, (42) Ohio 836.

depth of planting studies, (44) Oreg. 835.

development, (45) Idaho 218.

dried, vitamin C in, (47) 62, 268.

dropped, studies, (48) Del. 634.

drying, (41) 557; (45) Calif. 808.

dusting and spraying, (44) 52, Mich. 144, 156; (47) Mich. 439.

dusting experiments, (42) Va. 345, 637; (43) 752; (45) 45, Va. 137,

Mich. 235; (48) N.J. 354; (49) N.Y.State 39.

dusting v. spraying, (43) 743, 752; (45) 253, 254; (49) Conn.State 534.

early blooming and low production, (49) U.S.D.A. 636.

Apples—Continued.

effect of—

- cultivation, (44) Va. 739.
- self- and cross-pollination on yield, (43) Me. 645.
- shading, (47) N.H. 437.
- stock on scion, (50) 140.
- time of application of nitrogen, (48) 136.
- Ensee, new variety, (44) Ohio 741.
- export, maturity for shipment. (47) 238.
- export trade in United States, (43) 37.
- fall v. spring planting, (41) Mo. 648.
- fertilization by bees, (47) 128.
- fertilization, importance, (46) Del. 639.
- fertilizer experiments, (41) N.H. 43, Ill. 146, 341, Mo. 649; (42) N.Y. State 344, 638; (43) Oreg. 145, Ohio 340, Ohio 648, 833; (44) N.Y. State 534, W.Va. 638, W.Va. 639, Pa. 741, Oreg. 837; (45) Ill. 44; (47) Mich. 142, Pa. 437, Ark. 739; (48) Mass. 341; (49) Iowa 740; (50) Pa. 440.
- fertilizer experiments, interpreting yield records, (47) Pa. 640.
- flower bud formation date, (48) 443.
- forecasting bloom, (41) Mo. 648.
- freezing temperature for buds, (44) 740.
- frost resistant varieties, (45) 346.
- fruit—
 - bud development, (41) Mo. 648.
 - bud formation, (47) N.H. 436.
 - development, (45) Me. 639.
 - setting as affected by fertilizers, (43) Oreg. 145.
 - spurs, yearly yield, (43) 646.
- gases in intercellular spaces, composition, (45) 337.
- Golden Delicious, characteristics, (44) 536.
- grading laws, (41) 835.
- grafting experiments, (43) Ind. 338.
- grafting old trees, (42) 534.
- graphic records for, (42) 534.
- growing, (43) Nebr. 644; (45) 346; (47) 439.
- growing in Hood River Valley, (46) Oreg. 234.
- growing on cheap hill land, (41) Ohio 539.
- growth, relation to cover sprays, (50) 844.
- half tree fertilization, (48) 236.
- hardiness—
 - and early ripening, (41) 144.
 - determination, (46) 539.
 - studies, (45) N.Dak. 236.
 - testing by freezing points, (50) Minn. 125.
- hardy, ascertaining degree of hardiness, (49) Iowa 740.
- history and improvement, (46) 337.
- in Great Britain, life histories, (43) 744.

Apples—Continued.

- inheritance of yield, (45) Vt. 835; (46) 234; (48) Can. 37.
- injuries to, (47) N.Y. Cornell 753.
- injury from cranberry rootworm beetle, (44) 854.
- insects affecting, (42) 153; N.Y. State 95, 155, Mo. 754; (45) Conn. State 148, N.Y. State 455; (48) U.S.D.A. 252.
- insects affecting—
 - and resulting scars, (47) N.Y. Cornell 757.
 - handbook, (44) Oreg. 160.
 - in France, (50) 256.
 - in Georgia, (41) 549.
 - in South Dakota, (49) 448.
- insects deforming, (47) Pa. 161.
- internal browning, (48) U.S.D.A. 146.
- internal browning, cause, (47) Calif. 649.
- internal browning, control, (48) Calif. 535.
- irrigation studies, (50) Can. 340.
- keeping qualities, factors affecting, (43) 238.
- keeping quality, relation to time of picking, (50) Can. 340.
- long pruning, (46) 640.
- Malinda, open-pollinated seedlings, (43) 539.
- manuring experiments, (44) 145.
- Melba, new seedlings, (45) 833.
- new description, (48) Can. 37.
- new or noteworthy, (49) N.Y. State 338.
- new, origin, (46) 640.
- nitrogen and carbohydrate in developing fruit, (50) 835.
- northwestern boxed, distribution, (44) U.S.D.A. 837.
- northwestern, packing houses for, (45) U.S.D.A. 346.
- notching experiments, (43) 743.
- nutritive value, (41) 557.
- odorous constituents, (43) 711; (48) 607.
- orchard renovation, (48) U.S.D.A. 237.
- parthenocarp in, (44) 820.
- pectin content, factors affecting, (46) 207.
- pectin in, determination, (47) 610.
- physiology of, N.H. (43) 28, 29.
- picking, packing, and loading, (48) Ohio 639.
- planting distances, (41) 835.
- pollination studies, (42) 534, Calif. 832; (43) Me. 646, 744; (45) 346, Wash. 640; (46) 840; (47) Calif. 639, 742; (48) 444, Calif. 534; (49) 39, Ohio 339.
- pot-grown, fertilizer experiments, (49) 833.
- preparation for market, (42) U.S.D.A. 39.

Apples—Continued.

propagation, (42) Mass. 638; (49) Iowa 740; (50) 300.
 propagation project, (47) Pa. 438.
 pruning, (41) Mo. 649; (48) Mich. 436.
 pruning—
 experiments, (41) Kans. 41; (42) Calif. 139, 440; (43) Ind. 338, Ohio 341, 744; (44) 533, Oreg. 835; (45) 439, 538, 836; (46) N.J. 536, Del. 640; (47) Ind. 138, Ohio 141; (49) Ohio 337, N.Y.State 339, Ind. 531, Ky. 531, N.Y.Cornell 637, N.Y.State 742.
 experiments, winter, (48) N.J. 339, 638.
 fall v. spring, (47) 338.
 instructions, (43) Mo. 146.
 Lorette method, (45) 346.
 modified leader, (49) Wis. 639.
 relation to fruit bearing, (49) N.Y.Cornell 638.
 summer, (44) Oreg. 833.
 time in Minnesota, (43) 646.
 types, (46) N.H. 335.
 wounds, (41) 238; (42) Minn. 833.
 relation of tree type to productivity, (46) 841.
 resistance to cold, (41) U.S.D.A. 444.
 resistance to green apple aphid, (50) 845.
 respiration in, (46) 337.
 results of propagation methods, (49) N.Y.State 38.
 ringing experiment, (43) 742; (49) 138.
 ripening, changes in respiration rate, (50) 441, 542.
 Rome Beauty, memorial to, (45) 238.
 Rome Beauty, pruning, (45) 538.
 root development, (48) 736; (49) 38.
 root development as affected by soil management, (47) 341.
 Russian, in America, (48) 237.
 sacking, effect on keeping quality, (47) 832.
 sampling by weight, accounting forms, (46) 391.
 scar damage by insects, (45) 658.
 scion root production by, (43) 540.
 secondary flowering, (49) 834.
 seedling, breeding, (42) 737.
 seedling growth, (47) 341.
 seedling, variation in, (45) 346.
 self-compatibility tests, (50) Can. 339.
 self-sterility and cross-incompatibility in, (49) 234.
 setting, effect of defoliation, (45) Oreg. 237.
 shipped, flesh collapse of, (50) 449.
 size of fruit, factors affecting, (43) 647.
 size of fruit, relation to pruning, (48) 444.
 sizing machine, (41) Ohio 539.
 soil management, (48) Mass. 341.

Apples—Continued.

spoilage after harvest, (49) 49.
 spotted, diagnosis of fungi from, (46) 242.
 spotting in, (45) 546.
 spray formula, (42) 638.
 spray residue on, (47) U.S.D.A. 360.
 spray schedule, (41) 755; (42) Ark. 736, N.C. 896; (43) N.J. 37, 743; (44) Mo. 535; (45) Wash. 44; (46) U.S.D.A. 54, Colo. 55; (47) N.J. 140, Ohio 140; (49) N.J. 138.
 sprayed, arsenic content, (43) 798.
 spraying, (43) Ohio 340; (46) 552.
 spraying—
 and dusting, (44) 52, Mich. 144, 156; (50) 353.
 cooperative, (44) 536.
 effect on leaves, (44) 245.
 experiments, (41) Ill. 146, 160, Ohio 239, 340, 348, Mo. 356, Ohio 538, 657, Wis. 661, 755; (42) 637, 645; (43) Ind. 338, 358, N.Mex. 358, N.Y.Cornell 455, U.S.D.A. 843; (44) Pa. 53, Kans. 236, Mich. 543, 552, 648, Minn. 753; (45) Ind. 134, Ind. 143, 253, 457, 849; (46) 646; (47) Pa. 445, Wis. 446, Mich. 449; (49) N.Y.State 39, N.Mex. 154, Ohio 338, N.J. 349, Ohio 350, Wis. 644, West.Wash. 845.
 in no crop seasons, (47) Ark. 748.
 v. dusting, (47) Conn.State 140; (50) Can. 440.
 spreader tests on, (49) 353.
 stem length in, (42) 536.
 sterility in, (43) Me. 645; (45) Wis. 236; (49) Me. 139.
 stock selection, (44) 42.
 stocks for, (41) Iowa 237; (47) 238.
 storage, (41) Ill. 834; (45) Idaho 202; (46) 338; (50) 238, 541, 542.
 storage diseases, factors affecting, (44) 749.
 storage experiments, (43) Wash. 744; (44) Calif. 738; (45) 346; (49) 39.
 storage, light factor in, (45) 641.
 stored, oxidase activity in, (50) 299.
 sugar content as affected by soil, (41) 738.
 sun drying, (43) 808.
 thinning experiments, (42) 39; (43) Ohio 341, 646; (49) Mont. 136, Calif. 235; (50) Can. 340, Can. 643.
 tillage experiments, (49) Mont. 136.
 time for applying first spray, (50) 346.
 time of fruit bud differentiation, (49) 834.
 time of harvest studies, (49) Wash.Col. 232, Oreg. 533.
 transpiration studies, (46) 128.
 transporting 10-year-old trees, (44) 639.
 unusual injury to, (47) 328.
 use in bread making, (43) 64.

Apples—Continued.

- varieties, (47) Mich. 140, Miss. 238; (49) Mont. 136.
 - varieties—
 - detecting, (49) 139.
 - for Alaska, (44) Alaska 532.
 - for Canada and United States, (43) 438.
 - for Ohio, Ohio (42) 496; (43) 744; (44) 146.
 - for stock, (46) Iowa 334.
 - frost resistant, (47) Ohio 143.
 - hardy, (42) Minn. 834, Minn. 835.
 - S.Dak. 836; (44) U.S.D.A. 741.
 - in Canada, (46) 138.
 - in England, (43) 238.
 - in Great Britain, (45) 135.
 - in New Brunswick, (45) 44.
 - injured by winterkilling, (42) Minn. 836.
 - leaf characters, (47) Mass. 641.
 - new, (42) 637.
 - unsuited to southern Indiana, (43) 237.
 - variety, "P. J. Bergius," (41) 444.
 - variety tests, (44) 533; (48) Del. 675; (49) N.H. 336; (50) Can. 36, Can. 440.
 - vinegar-making properties, (47) 808.
 - vitamin B in, (43) 765; (44) 261.
 - water core in, (47) 342.
 - waxlike coating, constituents, (50) 7
 - Whitney, breeding experiments, (49) 139.
 - wild, of Cochin China, (45) 835.
 - Wilder medal recipient, (47) 340.
 - wilting, notes, (50) 541.
 - Winesap, moldy core in, (45) Wash. 243; (48) 147.
 - winter injury, (43) U.S.D.A. 435; (46) 139; (48) Mo. 455.
 - winter injury in 1917-1918, (42) Mass. 343.
 - winter study, (46) 839.
 - winterkilling, (43) Minn. 833.
 - Yellow Newtown, internal browning of, studies, (49) 545.
 - yield and keeping quality, (50) Can. 340.
 - yield and trunk circumference, correlation, (46) 539.
 - yield in relation to growth, (43) 647.
 - yield records, (45) Ohio 238.
 - York Imperial, eulogy, (46) 841.
- Apricot—
- bacterial gummosis, studies, (42) Calif. 843.
 - brown rot, notes, Calif. (44) 648, 743; (48) 541.
 - brown rot, prevention, (45) 53.
 - bud dying, notes, (48) Calif. 541.
 - die-back, notes, (45) 842; (46) 544.
 - diseases in Rhone Valley, (47) 49.
 - diseases, parasitic, 1915-1920, (49) 445.
 - fruit spot, notes, (47) Calif. 649.
 - gall disease, description, (50) 450.
 - gummosis, studies, (44) Calif. 743.

Apricot—Continued.

- leaf miner, life history and control, (42) 650.
 - leaves, transpiration, (48) 236.
 - limb gall, notes, (42) Calif. 843.
 - orchard survey, (43) Colo. 144.
 - rootstock, identification, (49) Calif. 637.
 - scab, (46) 453.
 - scale, brown, control, Calif. (44) 654, 752.
 - shoots, water deficit in, (47) Calif. 628.
 - shot-hole, control, (42) Calif. 843.
 - shot-hole, notes, (43) 243; (44) 49, 842.
 - trees, starch storage in, (50) 835.
 - twig blight, control, (42) Calif. 843.
- Apricots—
- culture experiments, (47) U.S.D.A. 438.
 - culture experiments in Arizona, (50) U.S.D.A. 138.
 - culture in Asia, (45) 45.
 - dried, analyses, (42) Calif. 862.
 - dried, antiscorbutic value, (47) 62.
 - dried, energy value, (46) 859.
 - drying, (41) 557; (45) 720, Calif. 808.
 - fertilizer experiments, (47) 339.
 - freezing temperature for buds, (44) 740.
 - girdling experiments, (48) Calif. 534.
 - growth rate, relation to sap concentration, (45) 124.
 - harvesting and handling for shipment, (47) Calif. 536.
 - in Morocco, (46) 140.
 - industry in California, (47) Calif. 536.
 - nickel and cobalt in, (49) 520.
 - pollination, Calif. (42) 832; (48) 535.
 - preserving, (45) 665.
 - pruning experiments, (42) Calif. 139; (44) Calif. 738; (47) 339, Calif. 639.
 - resistance to cold, (41) U.S.D.A. 444.
 - Sclerotinia on, (46) 47.
 - seasonal development of leaves, (48) Calif. 534.
 - spacing experiments, (47) Calif. 638.
 - spraying experiments, Calif. (42) 843; (44) 648, 752; (49) 53.
 - starch stored in, (50) 299.
 - stocks for, (44) 145; (45) 742.
 - storage experiments, Calif., (44) 738; (47) 639.
 - sulphuring tests, (47) 339.
 - sun drying, (43) 808.
 - thinning, (49) Calif. 235; (50) Can. 340.
 - transpiration studies, (47) Calif. 628.
 - variety tests, (43) U.S.D.A. 144.
- Apterolophus pulchricornis n.g. and n.sp., (41) 261.
- Apterygota, notes, (45) 250.
- Apyrgota of Brazil, (41) 758.
- Aquatic caterpillar of Nymphula sp., (49) 53.
- Arabinose fermentation by molds, (48) 203.
- Arabis alpina, gall formation in, (46) 741.

- Arachidic acid, determination, (41) 502; (47) 12; (49) 611.
- Arachin, nutritional deficiencies, (48) 61.
- Arachis oil, hydrogenation, (41) 805.
- Arachnid pests in Scotland, (41) 549.
- Arachnids of Pribilof Islands, (49) U.S.D.A. 652.
- Aradus, American species, (45) 659.
- Araecerus fasciculatus, *see* Coffee bean weevil.
- Argallus northoxus, poisonous to livestock, (45) Ariz. 479.
- Aranea sericata, food consumption, (41) 463.
- Araucaria—
cultivated in South Africa, notes, (49) 342.
diseases, (47) 44.
- Araujia sericifera, a potential weed, (48) 233.
- Arbor—
Day, (49) U.S.D.A. 641.
Day and Bird Day material, (47) 897.
Day, relation to civic betterment, (42) U.S.D.A. 141.
Lodge, gift to Nebraska, (49) 500.
vitae leaf miner, notes, (47) Conn. State 155.
- Arboretum, Bergius, historical review, (+- 344.
- Arboriculture in Spain, treatise, (41) 237.
- Arbutus unedo, treatise, (41) 653.
- Arceuthobium—
oxycedri on Cupressus, (45) 752.
pusillum, notes, (45) 541.
spp., biology and significance, (43) 821.
- Archips—
argyrospila, *see* Fruit tree leaf roller.
obsoletana, studies, (46) N.Y.Cornell 465.
rosaceana, notes, (42) 748; (46) 749.
spp., notes, (43) Mont. 758; (44) Oreg. 850, Oreg. 851.
- Archirileya, new genus, erection, (47) 660.
- Architects' handbook, (46) 691.
- Architecture, domestic, treatise, (45) 186.
- Arctia caja, blood cytology, (44) 758.
- Ardalus antillarum n.sp., description, (48) 59.
- Ardisia crispa, symbiosis studies, (42) 333; (43) 133.
- Arduenna strongylina, notes, (46) La. 281.
- Areca—
koleroga, notes, (42) 145, 146; (48) 741.
nut, taenicidal value, (46) 687.
nuts, preparation for market, (43) 745.
palm, culture and uses, (43) 745.
palm, diseases, (42) 46.
palm, Mahali disease, (43) 445; (44) 642.
palm root disease, notes, (45) 48.
- Arenaria hookeri, chemical examination, (49) Wyo. 476.
- Areolpristomerus, new subgenus, (45) 460.
- Argas—
miniatus, *see* Fowl tick.
persicus, cause of recurrent fever, (42) 570.
persicus, life history and control, (46) 778.
persicus, summary, (47) 559.
reflexus, chloropicrin gas for, (46) 465.
spp., notes, (49) 157.
- Argasidae in Punjab, (49) 157.
- Arghan fiber, commercial status, (50) 829.
- Argilus foveicollis on roses, (47) 658.
- Arginin—
determination, (43) 615.
effect on starch hydrolysis, (46) 708.
in tobacco seeds, (44) 201.
nitrogen, determination, modification of apparatus, (42) 711.
- Argon, anaerobic experiments with, (48) 825.
- Argopistes—
oleae n.sp., notes, (48) 654.
sexvittatus n.sp., notes, (48) 654.
- Argyresthia—
illuminatella, studies, (41) 61.
thuiella, notes, (47) Conn.State 155.
- Argyrophora abietana, notes, (46) Mich. 457.
- Argyroploce—
consanguinana, studies, (41) 61.
leucotreta in Africa, (45) 857.
leucotreta, notes, (42) 547.
- Arisaema, control of sexual state in, (49) 523.
- Aristida longiseta, mechanical injury to livestock from, (49) 679.
- Aristotelia fragariae—
n.sp., description, (41) 258.
notes, (47) 758.
- Arithmetic—
household, textbook, (46) 95.
problems, children's, (47) 299.
rural, problems, (43) 495.
vocational, for girls, textbook, (45) 496.
- Arizona—
Station, notes, (42) 197; (45) 199, 498; (46) 195, 699; (47) 300; (48) 194; (49) 196, 396, 697.
Station, report, (41) 397; (43) 798; (44) 598; (45) 496; (48) 497.
University, notes, (42) 197; (43) 398; (45) 498; (46) 195, 395, 699; (47) 300; (49) 196, 396, 697.
- Arkansas—
Station, notes, (41) 898; (45) 498; (48) 194; (49) 98; (50) 196.
Station, report, (47) 799.
University, College of Agriculture, facts about, (49) Ark. 297.
University, notes, (41) 898; (45) 498; (48) 194; (49) 98, 396.
- Armadillidium spp., notes, (50) 255.
- Armadillo, trypanosome infestation, (49) 180.

Armilaria—

control, (48) Calif. 542.

mellea—

as potato disease, (49) 443.

control, (46) 746; (47) Calif. 649, Calif. 754.

description, (46) Wash. 449.

enzym action in, (44) 27.

in rhubarb, (44) 49.

new hosts of, (44) 545.

notes, (43) 155, 243; (44) 347, 451; (45) 451, 653, 849; (47) 546.

on Rhododendron, (46) 150.

root rot on mushrooms, (43) 347.

sp., notes, (49) 540.

Armsby, H. P., biographical sketch, (45) 601.

Army—

agricultural committee, British, report, (43) 95.

cutworm, *see* Chorizagrotis auxiliars.

ration, Italian, criticism of, (44) 259.

rations, graphic method for balancing, (43) 167.

rations, methods of analysis, (41) 714.

rations, studies, (41) 854, 855.

Army worm—

control, (42) Ohio 360; (47) 55; (49) 448.

erratic, notes, (45) Mich. 251.

fall, control, (46) 660; (49) V.I. 352.

fall, injury to corn, (45) Ala.Col. 55.

fall, notes, (48) 357; (50) V.I. 555.

fall, on rice, control, (43) U.S.D.A. 253.

fall, summary, (46) 247.

meteorological relations, (49) Minn. 759.

notes, (43) 52, Conn.State 251, Ind.

352, 450, N.C. 450; (44) Iowa 452;

(45) Mich. 251; (46) 51; (49) 758.

on cranberries, (47) Mass. 452.

semiotropical, biology and control, (43) 557.

summary, (45) 854.

western wheat-head, life history and control, (43) 54.

Army worms of Minnesota, key, (43) 55.

Army worms, poison bait for, (47) 757.

Arnold, J. H., biographical sketch, (45) 99.

Aroma, notes, (48) Guam 228.

Aroro, culture directions, (45) 35.

Arotes, notes, (43) 858.

Arpax ruby, new pavement material, (42) 385.

Arrhenatherum elatius, seed production, (45) 740.

Arrhenothrips, new genus, erection, (42) 154.

Arriciamento of elm and hackberry, (42) 450.

Arrow grass, poisonous to livestock, (43) Nev. 77, Nev. 273; (45) Wyo. 479.

Arrowroot—

culture experiments, (46) Guam 726.

culture in Brazil, (44) 634.

culture in St. Vincent, (41) 528.

Arrowroot—Continued.

diseases, notes, (41) 745.

fertilizer experiments, (45) 33.

mulching experiments, (45) 33.

starch, digestibility, (47) 763.

starch from, (48) 630.

starch production in West Indies, (45) 33.

variety tests, (45) Guam 34.

Arsenate and arsenite, separation and detection, (45) 412.

Arsenate-Bordeaux preparations, analyses, (41) Mich. 443.

Arsenates—

color reaction for, (44) 611.

effect of soap on injury due to, (49) 750.

for boll weevil control, (43) 162.

preparation, (49) U.S.D.A. 448.

toxicity, (43) Oreg. 755.

Arsenic—

a catalytic fertilizer, (50) 324.

acid as substitute for vitamins, (50) 564.

and copper, iodometric determination, (47) 15.

as a soil sterilizer, (41) 537.

as anopheline larvicide, (46) 856; (49) 55.

available supply in United States, (48) 749; (50) 554.

behavior of bacteria toward, (41) 376; (44) 77.

copper dust, value, (46) 846.

determination, effect of nitrates or nitrites, (47) 503.

determination in gelatin, (50) 712.

determination in vegetable oils, (42) 610.

dust, notes, (43) 850.

effect on soil bacteria, Mont. (44) 341; (46) 343.

effect on wheat, (44) 512.

fate in sheep, (41) 873.

for grub-infested soils, (45) 258.

in animal body, fate, (44) 76.

in food materials, (45) 665.

in leaves, fruits, and wine after spraying, (47) 552.

in soils, (46) 814.

in subterranean waters, (47) 288.

inhalation from arsenical dusts, (50) 453.

microtitration, (41) 873; (42) 206.

oxid, determination in calcium arsenate, (41) 799.

poisoning, action of magnesium sulphate in, (45) 178.

relation to boll weevil control, (50) 851.

relation to plant growth, (48) 326.

salts for codling moth, (47) 551.

solution for poisoning green timber, (50) Mich. 445.

sprays, effect on bees, (43) Ind. 856.

supply of Nova Scotia, (46) 51.

toxic action on plants, (49) 127.

Arsenic—Continued.

- water-soluble, determination, (50) 196.
- water-soluble, of lead arsenates, expression, (50) 205.
- white, use, (47) 53.
- white, use in Bordeaux mixture, (43) 850; (46) Mass. 50; (49) 50.

Arsenical—

- compounds for blackhead treatment, (49) 382.
- dip, preparation, (44) 78.
- dips for cattle, (41) 286, 376, 873, 874, U.S.D.A. 878.
- dips, oxidation in, (42) 76.
- dips, reduction in, (42) 77.
- injury, studies, (50) Mont. 143.
- injury to plants and excretions from leaves, (50) 525.
- spray for codling moth control, (49) 759.
- sprays, comparison, (44) 247.
- sprays, spreading and adherence, (46) Minn. 852.

Arsenicals—

- and mixed sprays for fruits, (45) 45.
- cheaper, use, (47) 53.
- comparative value, (46) Mich. 443.
- effect on oriental peach moth, (44) 551.
- electrometric analysis, (44) 11.
- for fruit trees, (47) 152.
- for grasshopper baits, (48) Nebr. 551.
- in viticulture, restriction of use, (47) 551.
- injury to foliage, (47) Mass. 646; (48) Mass. 346; (49) 750.
- insecticidal value, (41) 59, Wis. 661; (47) 655.
- organic, development of chemotherapy, (47) 283.
- poisoning of bees by, (43) Ind. 351.
- properties, (49) U.S.D.A. 448.
- reaction of Japanese beetle to, (47) 56.
- suspension quality and cost, (44) Mass. 453.
- toxicity, (44) Minn. 753; (49) U.S.D.A. 449.
- toxicity for insects and hosts, (47) Minn. 357.
- use, (45) 656.
- viticulture, and plant protection, paper on, (49) 50.
- white, coloring for stock dipping, (49) 378.

Arsenious—

- acid, disinfecting power, (43) 78.
- acid, effect on growing plants, (45) 528.
- oxid for poison bait, (41) 251, 252.

Arsenite and arsenate, separation and detection, (45) 412.

Arsenites—see also Paris green.

- injury to foliage, (48) Mass. 346.
- preparation, (49) U.S.D.A. 448.
- toxicities, (49) U.S.D.A. 449.

Arsilouche albovenosa, studies, (46) N.Y.Cornell 465.

Arsine, insecticidal value, (44) U.S.D.A. 56.

Arsphenamin, parasiticidal value, (47) 882; (49) 479.

Artemisia spinescens, poisonous to live-stock, (43) Nev. 273.

Artesian water, conference on, report, (48) 587.

Arthrollytus apatela, notes, (45) 856.

Arthropods, Antarctic land, occurrence and distribution, (46) 752.

Artichoke—

- diseases, notes, (41) 745.
- girdler, notes, (45) 159.
- macrosiphon, dipterous enemy, (41) 455.
- plume moth, notes, (47) 853.
- rot, notes, (48) 741.

Artichokes—

- culture, (48) 337.
- culture in Sicily, (49) 37.
- feeding value, (50) 376.
- globe, analyses, (47) Calif. 660.
- globe, changes in vitamins, (50) 462.
- globe, inulin content, (44) 110.
- inulin preparation from, (47) 202.

Jerusalem—

- culture, treatise, (47) 736.
- digestibility, (41) 362.
- inulin in, (42) 226.
- sirup from, (44) 313.
- sunflower grafts on, (48) 221.
- triple infection of, (49) 45.
- white, feeding value, (48) 265.

Arts, related, course for high schools, (49) 798.

Arum—

- bacterial disease, treatment, (47) 542.
- soft rot, notes, (50) 547.
- utilization, (41) 117.

Arundo phragmites meal, feeding value, (42) 369.

Arvelius albopunctatus, control, (49) V.I. 353.

Arvicole in Italy, biology of, (43) 250.

Arzama obliqua, studies, (46) N.Y.Cornell 465.

Asaphes americana, parasitism by, (44) Va. 756.

Asarcia, status of genus, (42) 353.

Ascarapis woodi, protection against introduction into America, (49) 357.

Ascariasis—

- lecture on, (42) 674.
- pulmonary, in young pigs, (45) 887.

Ascaricides, notes, (50) 380.

Ascarid—

- infestation in swine, (41) 784.
- larvae, migrating course in host, (42) 75.

Ascaridae, classification, (44) 375; (45) 74.

Ascaridia—

- galli, treatment for, (49) 684.
- perspicillum, control, (50) 82.
- perspicillum, development, (45) 888.
- perspicillum in chicks, cause of pneumonia, (47) Okla. 883.

Ascaridole—

- anthelmintic value, (50) 380.
- determination in chenopodium oil, (46) 311.

Ascarids—

- control, (41) 480, 782; (49) 77.
- in man and hog, differentiation, (43) 380.
- removal by anthelmintic, (42) 379.
- treatment for, (46) 685.

Ascaris—

- anoura, notes, (43) U.S.D.A. 276.
- columnaris, morphology and life history, (49) 499.
- eggs, resistance of, (43) 80, 381.
- in swine, (47) Ohio 684, Nebr. 789.
- larvae, course of migration, (47) 182; (48) 680.
- larvae in the brain, (47) 284.
- larvae, migration of, (43) U.S.D.A. 276.

lumbricoides—

- and *Ascaris suilla*, identity, (48) 179.
- eggs, detecting in feces, (48) 383.
- extracts, (46) 379.
- in man and hog, (43) 380.
- in pigs, (45) U.S.D.A. 788.
- life history, (43) U.S.D.A. 275; (45) 160.
- present status of knowledge, (48) 84.
- relation to pulmonary disease, (43) 80.
- studies, (41) 285, 286.

megalocephala—

- as affected by thymol, (46) 885.
- embryonated eggs, feeding effects, (49) 179.

of cattle, (48) 179.

- spp., effect on coagulation of blood, (45) 477.

- suilla* and *A. lumbricoides*, identity, (48) 179.

suum—

- larvae, migration, (44) 778.
- or *suilla*, life history, (43) U.S.D.A. 275.
- studies, (42) 383; (45) 160.

vitulorum—

- extracts, effects on experimental animals, (49) 76.
- life history, (48) 84.
- notes, (47) 487.

Aschersonia—

- aleyrodis, notes, (45) V.I. 150.
- pisiformis, notes, (47) 547.

Ascidia formation, studies, (41) 429.

Asclepias mexicana, poisonous to livestock, (43) Nev. 273.

Ascochyta—

- cynarae, notes, (49) 45.
- disease of cotton, life history, (47) Ark. 447.
- fagopyrum on buckwheat, studies, (42) 242.
- gossypii, notes, (47) Ark. 748.

Ascochyta—Continued.

- leaf blotch, notes, (44) 842.
- lycopersici, notes, (46) 451.
- on peas, (46) 241.
- on tomato, (43) 346; (44) 749.
- phaseolorum, notes, (46) 845.
- pisi, notes, (44) 642, Ala.Col. 744; (48) 741.
- pisi on beans, (42), 351.
- sp., notes, (42) 150.

Ascochytae, North American, descriptive list, (42) 434.

Ascocotyle, n.spp., description, (44) 158.

Ascomycetes—

- fruiting forms, (45) 746.
- morphology and life history, (46) 722.
- specialization in, (47) 844.
- spermatia of, life histories, (45) Ga. 47.

Ascospore discharge, novel method, (41) 746.

Asemothrips, new genus, erection, (41) 551.

Ash—

- constituents in body tissues on various diets, (49) 564.
- constituents of plants, (41) 502.
- content of crops as affected by soils and fertilizers, (41) 422, 813.
- determination in gelatin, (50) 712.
- determination in sugar and molasses, (49) 505.
- determination in sugar, methods, (49) 408.
- of foods, alkalinity, (48) 205.
- of foods, alkalinity and phosphate determination, (45) 717.
- soils, fertilizer requirements, (50) 817.
- translocation in apple trees, (43) N.H. 28.

Ash (tree)—

- borer, red-headed, temperature fatal to larvae, (45) 662.
- green, culture experiments, (48) N.Dak. 239.
- leaves and twigs, feeding value, (45) 774.
- mountain, growth studies, (42) 739.
- mountain, log measurements, (42) 142.
- rust, notes, (44) Conn.State 149.
- seed weevil, control, (47) Ohio 359.
- seeds, delayed germination, (49) 141.
- tree, aleurodid enemy of, (50) 556.
- trees, *Leperidinus californicus* affecting, (50) 259.
- white, cause of brashness, (45) 46.
- wood, water conductivity, (43) 31.

Ashes—

- Atriplex halimus, fertilizing value, (47) 819.
- coal and coke, as fertilizers, (46) 220.
- from sugar refinery furnaces, fertilizing value, (47) 218.
- lignite, fertilizing value, (48) N.Dak. 37.
- wood, see Wood ashes.

Asilidae in District of Columbia, (42) 652.

Asparagin, effect on amylase, (42) 203.

Asparagus—

- anthracnose, (44) Conn.State 149.
- as affected by rock salt, (46) 732.
- Bacillus botulinus* on, (44) 763.
- beetles, control, (41) Ohio 555.
- beetles, notes, (41) 59; (47) Conn.State 156.
- canned, bacterial flora, (46) 859.
- canned, bacteriological studies, (46) Kans. 467.
- canned, botulinus poisoning from, (42) 57.
- canning, (44) Kans. 206, 663.
- canning, temperature changes in, (45) U.S.D.A. 560.
- crowns, grading, (44), Pa. 740.
- culture, (43) Wash. 397; (47) Calif. 637.
- diseases, (44) N.J. 341; (45) 649.
- edible portion and waste, analyses, (43) 63.
- fertilizer experiments, (41) Mass. 21; (43) Md. 144, Mass. 537, Pa. 537; (49) R.I. 533.
- fly in France, (48) 56.
- growth, physical and chemical factors, (48) 824.
- irrigation experiments, (42) 138.
- new disease of, (50) 747.
- resistance to alkali, (43) Ariz. 724.
- Rhizoctonia* disease, control, (41) 841.
- root rot, notes, (43) 347; (45) 542.
- rust, notes, (43) 151, Mass. 538; (48) 244.
- seed, carbohydrate content, (48) 222.
- selection studies, (46) 335.
- soup stock from waste asparagus, (44) 534.
- tops, dried, feeding value, (42) 369.
- varieties, (50) Mont. 139
- variety tests, (43) Pa. 537; (49) Mont. 136.
- verticillatus*, cellular constitution in, (45) 30.
- vitamin B in, (47) 267.

Aspartic acid—

- effect on amylase, (42) 203.
- yield from prolin, (42) 201.

Aspen—

- borer, control, (44) U.S.D.A. 355.
- canker, (46) 454.
- diseases, (45) 549.
- European, life history notes, (45) 350.
- leaf curler, summary of information, (44) 753.
- production in Sweden, (41) 345

Aspergillaceae, growth as affected by

- saccharose, (42) 627.

Aspergillois in chickens, epizootic, (50) 788.

Aspergillus—

- cellulosae* n.sp., description, (44) 567.
- delacroixii*, notes, (49) 540.
- flavus*, studies, (42) 336.
- fumaricus*, fermentation of sugar by, (43) 15.
- fumigatus*, notes, (50) 788.

Aspergillus—Continued.

- fumigatus* on straw, digestion experiment, (44) 567.
- glaucus-repens*, notes, (49) 263.
- growth, effect of metal salts, (49) 27.
- in cane sugar, (41) La. 416.
- in sugar solution, studies, (46) 206, 417.
- niger*—
 - action of zinc sulphate on, (41) 746.
 - autotoxicity in, (43) 524.
 - effects of acids on, (43) 523.
 - fermentation of sugar by, (48) 203.
 - food requirements, (45) 465.
 - formation of organic acids by, (46) 225.
 - formation of soluble starches by, (43) 523.
 - glucose utilization by, (50) 125.
 - growth, effect of salt proportions, (46) 629.
 - growth, energy ratio, (50) 428.
 - growth stimulation, (43) 130.
 - in gold solutions, studies, (41) 329.
 - oxalic acid production by, (43) 112.
 - penetration into hardwood, (50) 656.
 - proteolytic enzymes, (41) 822.
 - respiration studies, (41) 524; (43) 820.
 - sources of sulphur for, (49) 26.
 - spore germination, effect of acidity, (44) 28; (49) 125.
 - studies, (42) 246, 336, 628, 727, 803, 804.
 - utilization of α -methylglucosid by, (43) 203.
 - utilization of organic substances, by, (49) 126.
- oryzae*—
 - enzym, use in clarification of fruit juices, (47) 206.
 - enzymic extract of, comparison with malt diastase, (43) 503.
 - formation of perithecia by, (50) 545.
 - spores, longevity, (50) 630.
- perithecia production by, (45) 746.
- repens*, enzym activity, (43) 779.
- repens*, sugar inverting power, (50) 728.
- sp., notes, (44) 445; (46) 451.
- sp. on figs, (50) 751.
- sp., utilization of citric acid by, (50) 630.
- spp., conidia formation, (43) 524.
- spp., growth inhibiting factors, (49) Iowa 722.
- spp. in corn meal, (46) 356.
- spp. in soil, activities, (50) 620.
- spp., notes, (45) Tex. 50.
- spp., resistance to sunlight, (47) 784.
- spp., studies, (42) 162, 608; (44) 27.

Aspergillus—Continued.

- sydowi, notes, (44) La. 116.
- sydowi, studies, (42) 336, 803, 804.

Asphalt—

- and allied substances, treatise, (43) 186.

limestone, for mortar, (41) 884.

Asphaltum compounds, insecticidal value, (44) Pa. 757.

Asphodel as food for animals, (50) 168.

Asphodelus luteoides n.sp., notes, (44) 820; (46) 721.

Aspidiotiphagus—

- citrinus, notes, (45) 553.
- lounsburyi, introduction into Italy, (47) 660.

Aspidiotus—

- ancylus, *see* Putnam's scale.
- destructor on avocados, (42) 546.
- destructor on coconut, (46) Guam 748.
- ficus, *see* Florida red scale.
- ostreaeformis, *see* Fruit scale, European.
- perniciosus, *see* San José scale.
- sp. on coconut, (43) 52, 851.
- uvae, *see* Grape scale.

Aspirin, effect on heat regulation, (43) 371.

Asses—

- breeding in Catalonia, (47) 866.
- breeding in North Africa, (42) 560.
- Catalonian, description, (46) 875.
- improving in France, (47) 571.
- international trade, (46) 675.

Association of—

American Agricultural Colleges and Experiment Stations, (41) 300, 595, 601.

Feed Control Officials, (41) 563, 564; (44) 300, 364; (47) 900.

Land-Grant Colleges—

- editorial, (41) 601; (43) 701; (45) 701; (47) 701; (49) 701.
- notes, (42) 700; (47) 300.
- officers, (43) 800; (45) 800; (47) 800; (49) 799.
- proceedings, (45) 798; (49) 491, 596; (50) 895.

Official Agricultural Chemists—

- notes, (41) 300; (44) 414.
- proceedings, (41) 799; (43) 115; (44) 99, 616, 801; (47) 108; (48) 99, 607; (50) 196.

Official Seed Analysts, proceedings, (44) 232, 233; (46) 731; (50) 739.

Southern Agricultural Workers, (42) 301, 400; (44) 498; (48) 499; (50) 398.

Aster—

China, Septoria leaf blight on, (47) 548.

China, wilt disease, (41) 846.

disease, new, (43) 544.

diseases, (48) Can. 144.

Aster—Continued.

- woody, poisonous to livestock, (42) 879; (45) Wyo. 479.

Asteridium ferrugineum, notes, (47) 547.

Asterochiton—

- n.spp., description, (47) 657.
- spp., studies, (48) Ky. 356.
- vaporariorum, notes, (47) 255.

Asterocystis radialis—

- notes, (45) 649.
- radialis on tobacco seed plats, (47) 541.

Asters, culture experiments, (48) Can. 450.

Astragalus—

- sinicus, decomposition in rice fields, (46) 715.

tetrapterus, poisoning of livestock by, (43) U.S.D.A. 77.

Asymplesiella india, parasitism by, (47) 358.

Ataxia n.spp., description, (44) 166.

Athletes, metabolism, (41) 761.

Athous haemorrhoidalis—

- life history, (46) 462.
- notes, (42) 855; (48) 460.

Athyrium filixfemina, evolution of chondriome in, (45) 30.

Atlas of American Agriculture, precipitation and humidity, (49) U.S.D.A. 313.

Atlas of American Agriculture, precipitation section in, (47) U.S.D.A. 414.

Atmometers—

- blackened spheres for, (50) 328.
- nonabsorbing mounting for, description, (43) 733.

Atmosphere—*see also* Air.

- characteristics, (42) 317.
- circulation in middle latitudes, (47) 209.
- composition, apparatus for determining, (44) 16.
- cooling power, effect on metabolism, (47) 665, 666.
- evaporation capacity in relation to aridity, (43) 16.
- lunar tide in, (41) 211.
- moist, transmission percentage of radiation through, (41) 808.
- optical properties, (43) 618.
- physical phenomena, (44) 617.
- relation to plant nutrition, (41) 501.
- standard, (43) U.S.D.A. 718.
- water vapor in, (49) 15.

Atmospheric—

- circulation, treatise, (49) 614.
- conditions, effect on barley in India, (47) 228.
- environment and health, (44) U.S.D.A. 717.
- moisture—*see also* Humidity.
 - withdrawal by trees, (43) 16.
- motion, studies, (44) U.S.D.A. 121.
- movements and weather forecasting, (47) 509.
- pollution, (41) 211, 315; (45) 320.
- pollution, measurement, (44) 209.

Atmospheric—Continued.

pressure—

diurnal change, (44) U.S.D.A. 121.

distribution, (44) 508.

distribution charts, (44) U.S.D.A. 121.

effect on Polenske and Reichert-Meissl values, (44) 412.

maps, making, (44) U.S.D.A. 717.

periodicities in, (42) 212.

secondary lows, (45) 17.

refraction, irregular, at high altitudes, (44) U.S.D.A. 416.

Atomaria linearis on beets, (47) 551.

Atopognathus, new genus, description, (41) 261.

Atresia, follicular, in rabbit ovary, (44) 266.

Atriplex—

canescens, analyses, (43) N.Mex. 374.

canescens as pasture, notes, (42) 797.

canescens, digestibility, (48) N.Mex. 266.

halimus ashes as fertilizer, (47) 819.

semibaccata, culture and use, (41) U.S.D.A. 827.

semibaccata, culture in Chile, (45) 532.

spp., poisonous to livestock, (43) Nev. 273.

Atrodes spp., studies, (42) 454.

Atropin, effect on—

caterpillars, (48) 550.

deficiency disease in pigeons, (49) 769.

Atrytone vittellus, notes, (48) 357.

Attacus ricini, notes, (49) 154.

Attagenus piceus, control, (50) U.S.D.A. 56.

Attar of roses, production, (41) 742.

Atterberg Schlamm cylinder, (42) 119.

Aucuba japonica cuttings as affected by carbon dioxide, (49) 836.

Aulacaspis pentagona—see also *Diaspis pentagona*.

notes, (45) V.I. 150.

Auloicerya, new genus, erection, (49) 851.

Auroras in United States, (44) U.S.D.A. 121.

Australencyrtus giraulti n.g. and n.sp., life history notes, (48) 256.

Australian saltbush—

culture and use, (41) U.S.D.A. 827.

culture in Chile, (45) 532.

Autoclave, modification, (46) 201.

Autographa brassicae, see Cabbage looper.

Autointoxication symptoms, origin of, (42) 465.

Auto-irrigators, use, (48) 617.

Automobile—

design and construction, (42) 84.

gasoline, treatise, (49) 85.

registrations, (44) U.S.D.A. 139.

tires, dynamometer tests, (50) 486.

tires, power losses in, (48) 90.

Automobiles—

economy of operation, (43) 187.

use in soil surveying, (43) Tex. 281.

Automotive power, encyclopedia, (50) 486.

Autopsies, paper on, (49) 178.

Auxanometer, new, (43) 32.

Auximones, review of literature, (41) 558.

Avena—

coleoptiles, behavior of, (44) 824.

spp. as weed pest in Russia, (49) 37.

Averrhoa carambola leaf spot, control, (48) 149.

Avian diseases, detection and control, (42) Calif. 885.

Avitaminosis—

acute and latent, (48) 262.

alkali reserve of blood in, (50) 862.

and inanition, (45) 868.

as affected by histamin, (49) 261.

B in pigeons, changes in weight of organs, (50) 62.

B in pigeons, studies, (50) 62.

blood of pigeons in, (50) 860.

carbohydrate metabolism in, (49) 565; (50) 163.

cephalin and lecithin of brain in, (50) 862.

course, in partial starvation, (50) 565.

course of, effect of function, (49) 566.

effect on lactation, (48) 162.

enzymic activity of digestive apparatus in, (49) 161.

experiments, technique, (42) 365.

experiments with chicks and ducks, (49) 64.

fat content of blood in, (50) 860.

fat metabolism in, (50) 860.

glycogen formation and exchange in, (50) 863.

in fishes, (49) 565.

in guinea pigs, changes in weight of organs, (50) 465.

phosphorus metabolism in, (50) 862.

tissue respiration in, (47) 860.

Avocado—

anthracnose, (42) 645.

die-back, (42) 646.

die-back, control, (48) Hawaii 351.

diseases, studies, (41) Fla. 545; (43) 550; (47) Fla. 650.

fat, digestibility, (42) 552.

fungus disease, notes, (50) 354.

lace bug, notes, (47) U.S.D.A. 157.

red spider, control, (43) 255.

rot, studies, (42) 643.

tree records, methods of keeping, (43) 837.

twig die-back, (46) 845.

weevil, new, from Canal Zone, (44) 460.

white fly, notes, (47) U.S.D.A. 157.

Avocados—

analyses, Calif. (44) 738; (47) 660.

breeding, (48) 40.

Avocados—Continued.

- budding experiments, (42) 443.
- changes in composition during growth, (47) U.S.D.A. 537.
- chemical studies, (48) Calif. 506.
- cold storage studies, (42) Calif. 831.
- Conotrachelus affecting, (50) 458.
- cross-pollination, (50) 238.
- culture, (42) 140, 737; (45) Guam 43; (50) Calif. 342.
- culture—
 - and marketing in Mexico, (42) 239.
 - experiments, (41) 650; (48) Hawaii 338.
 - in Atlixco Valley, (43) 835.
 - in Florida, (43) 342, 837.
 - in West Indies, (42) 442.
- dictyospermum scale on, control, (45) 553.
- effect of girdling, (45) 742.
- embryo budding, (50) 644.
- enzymes of, (48) 108.
- Gracilaria perseae on, (44) 163.
- grafting, (50) 543.
- grafting and top-working, (43) 837.
- Guatemalan, (41) 446.
- in Florida, (46) 40.
- in Guatemala, (41) U.S.D.A. 45.
- insects affecting, (41) 260, 354, 460, 756; (42) 546; (43) 53, 255, 851; (45) 551; (46) 351, 458, 748; (47) 53, U.S.D.A. 156.
- new variety, (44) Hawaii 44.
- nutrition studies, (48) 159.
- pollination, (49) 237.
- preliminary revision, (43) 239.
- preserving, (44) Hawaii 16.
- pyriform scale on, control, (44) 353.
- spraying experiments, (43) 255.
- storage, notes, (48) Calif. 535.
- time for harvesting, (43) 837.
- types in Porto Rico, (49) 341.
- varieties, (42) 238; (43) 342.
- variety tests, (46) Hawaii 640.
- vitamin content, (46) 667.

Azalea—

- new species of Aleurodidæ on, (43) 557.
- root rot, (46) 150.

Azofication—

- effect of nitrogen in soil, (50) Utah 119.
- in soil, effect of salts, (47) 516.
- review of literature, (41) 124.

Azotobacter—

- agile, effect of colored light, (47) 31.
- agile, effect on plant growth, (47) 21.
- agile, studies, (49) 18.
- and yeasts, comparison, (41) Tenn. 430.
- as source of Vitamin B, (49) 364.
- chroococcum—
 - conditions affecting growth, (42) 225.
 - culture in sterilized soil, (41) 812.

Azotobacter—Continued.

- chroococcum—continued.
 - in partially sterilized soil, (47) 417.
 - nitrogen fixation by, effect of pH value, (48) 719.
 - sensitiveness toward boron, effect of humus, (48) 816.
 - studies, (43) 514; (45) 726.
 - volutin in, (43) 124; (49) 731.
 - content of soil, effect of changing reaction, (49) 619.
 - effect of—
 - absolute reaction of soil solution on, (44) Kans. 213.
 - nitrate on growth, (43) Pa. 514.
 - reaction of media, (48) 19.
 - fixation of nitrogen by, studies, (42) Calif. 812.
 - flora as affected by absolute reaction of soil, (49) 813.
 - growth and nitrogen-fixing ability, effect of pH, (49) 722.
 - growth cycle, studies, (45) 338.
 - growth, stimulating by aeration, (49) 213.
 - in soils, (48) 120.
 - life history, (49) 221.
 - nitrogen-fixing power, effect of metabolism products, (46) 714.
 - notes, (41) 721.
 - nutritive medium for, (44) 814.
 - protein synthesis by, (49) 626.
 - studies, (41) 125; (45) 810.
- "Azotogen" inoculation, studies, (48) 827.
- Babassu, culture and expression of oil, (43) 240.
- Babcock test, modification, (50) 11.
- Babesia—
 - bovis, synonymy, (42) 570.
 - caballi, notes, (43) 83.
 - canis, studies, (45) 183.
 - minor, notes, (45) 883.
 - minor, specificity of, (43) 182.
- Babesiosis—
 - distribution, (48) 182.
 - of dromedary, treatment, (49) 400.
- Baby beef, *see* Cattle, baby beef.
- Baccharis—
 - cordifolia, poisonous to livestock, (45) 781, 782.
 - peronioides, poisonous to livestock, (44) 180.
- Bacilli—
 - lactose-fermenting, differentiation, (41) 888.
 - spore-bearing, from wounds, (41) 476.
- Bacillus—
 - abortus—*see also* Bacterium abortum and Abortion.
 - agglutinins, transmission from cow to calf, (46) 882.
 - and B. melitensis, comparison, (43) 880.
 - and B. melitensis, pathogenicity, (47) 678.

Bacillus—Continued.

abortus—continued.

- and *Micrococcus melitensis*, relationship, (48) 481; (49) 881.
- antigen, preparation, (44) 480.
- behavior, (49) Kans. 478.
- detecting, (47) 185.
- discharge, detection in milk, (50) 682.
- elimination with milk, (46) 882.
- equi, notes, (45) 179.
- germ-free filtrates, behavior, (50) 681.
- growth as affected by culture media, (49) Okla. 477.
- infection of bulls, (41) 683.
- notes, (44) 184.
- pathogenicity for guinea pigs, (48) 580.
- power to cause abortion, (43) 683.
- relation to *B. melitensis*, (41) 778.
- relation to cellular count of milk, (41) Mich. 578.
- serologic grouping of, (43) 879.
- tests for detection of, (42) 674.
- type in swine, (48) 380.

acetoethylicum—

- biochemistry, (41) 415.
- factors affecting production of acetone by, (44) 710.
- fermentation of corn-cob sirup by, (46) 208.
- studies, (46) 781.

acidophilus—

- effect on chicks, (50) 884.
- intestinal implantation, (45) 65.
- milk, therapeutic value, (48) 866; (50) 161.
- nature of action, (49) 363.
- notes, (43) Conn.Storrs 767, Conn. Storrs 769; (49) 561.
- therapeutic application, (46) 870.

actinoides—

- notes, (48) 282.
- relation to bronchopneumonia in calves, (45) 384, 385.

adherens, growth-promoting substances of, (50) 664.

aerofetidis, effect of plant tissue on, (50) 879.

aerogenes—

- and *B. coli*, differentiation, (42) 274, 275.
- capsulatus in milk, toxic properties, (42) 875.
- capsulatus, studies, (41) 476.
- distribution in water, (42) 275.
- notes, (49) R.I. 81.

aertrycke—

- in milk, poisoning from, (48) 867.
- notes, (44) 264.
- virulence and host susceptibility, (49) 882.

amarus, description, (42) 174.

Bacillus—Continued.

amylovorus—

- carriers, (41) N.Y.State 253.
- notes, (42) 645; (44) Del. 444; (45) 843; (46) 543; (48) 350; (50) Ga. 543.

anthracis—

- antigen of, (41) 875.
- stainability as affected by pasteurization, (44) 675.
- studies, (50) 79.
- suspension for agglutination reactions, (41) 377.

aroideae, notes, (50) 547.

- atrosepticus, notes, (43) 655; (44) 447, 449; (45) 354; (46) Can. 146, 847; (48) 348, 547; (49) 46.

avisepticus—

- immunization, (42) R.I. 78.
- notes, (41) 580; (48) 277, 278.
- relation between types, (49) 381.

B., studies, (43) 111.

bellonensis, notes, (44) 373.

bellonensis, prophylaxis, (41) 577.

bifermentans sporogenes, studies, (41) 476.

bifidus, notes, (43) Conn.Storrs 767; (47) 463.

bipolaris septicus, studies, (48) Nebr. 82; (50) 683.

bipolaris, studies, (47) Nebr. 787.

botulinus—

- American strains, purity, (46) 262.
- antitoxin, (42) 558, 662.
- characteristics and toxin, (47) 67.
- cultural characteristics and isolation, (47) 271.
- distribution, (42) 260; (44) 763; (47) 679; (49) 861.
- effect of lemon juice on, (42) Calif. 863.
- growth and biochemical activities, (50) 785.
- identification, (50) 64.
- in Alaska and Canada, (49) 862.
- in anti-hog-cholera serum, (47) 487.
- in California, distribution, (49) 860.
- in canned olives, (44) Calif. 762.
- in canned spinach, (46) 361; (49) 163.
- in cheese, (45) 369.
- in Hawaiian Islands and China, (49) 862.
- in hog cholera serum, (46) 379.
- in ripe olives, (43) 168.
- in Santa Barbara Co., Calif., (49) 861.
- in silage and canned foods, (45) 667.
- in soils and foods, enrichment and demonstration, (49) 860.
- in soils and vegetables from same, (50) 365.

Bacillus—Continued.

botulinus—continued.

- in swine diseases, (47) 680.
- in western Europe, (49) 862.
- notes, (43) 84; (46) 684; (48) 365.
- pathogenicity, (45) 467; (47) 271; (49) 862.
- presence in factory-canned products, (42) 261.
- relation to canned foods, (45) 167.
- resistance to heat, (43) 169; (44) 558; (47) 679; (49) 162, 863.
- resistance to salt, (44) 558, 559.
- resistance to sterilizing agencies, (43) 169.
- spores, thermal death point, (46) 670, 763.
- strains, relationship, (49) 255.
- strains, typing, (46) 670.
- studies, (41) 169, 280; (42) 58, 262, 762.
- toxic by-products, (45) 769.
- toxicity, effect of acidification, (50) 569.
- toxin, destruction by heat, (45) 369.
- toxin, inoculation test, (45) 870; (46) 262.
- type A in excretions of poliomyelitis patients, (47) 169.
- type A in horses, (45) 882.
- type C, chemical activity, (50) 785.
- types, (49) Ill. 366.
- types A and B, differentiation, (45) 870.
- types, description, (42) 260.
- under household conditions, (49) 567.
- bovisepeticus, bacterin from, (43) Nev. 272.
- bovisepeticus, notes, (48) 282.
- bulgaricus—
 - inoculation of corn silage with, (44) 175.
 - milk, (43) Conn.Storrs 768.
 - production of vitamins by, (48) 760.
 - stainability as affected by pasteurization, (44) 675.
 - studies, Conn.Storrs (43) 767, 769.
 - use as cheese starter, (42) 564, Calif. 876; (44) 874.
- butyricus, notes, (41) 476; (45) 422.
- carotovorus—
 - biology, (46) 449.
 - fermentative activity, (46) N.C. 740.
 - notes, (42) N.Y.State 350; (44) Conn.State 150; (46) 44; (48) 146, 242, N.J. 347; (49) 651.
- caudatus, studies, (41) 20.
- caulivorus, notes, (46) 451; (49) 45.
- cellulosae dissolvens, notes, (50) 763.

Bacillus—Continued.

- cerealium, notes, (45) 542.
- cereus, action on manure, (48) N.Y. State 20.
- cereus, notes, (42) N.Y.State 325.
- chauvanei—
 - characteristics, (46) 480.
 - effect of plant tissue on, (50) 879.
 - soluble toxin produced by, (48) 878.
- cholerae suis—
 - in man, (43) 685.
 - infection of food with, (47) 170.
- citrinaculans, notes, (41) 450, 546.
- cloacae—
 - action on sewage, (47) 490.
 - as transformer of cyanamid, (42) 428.
 - notes, (49) R.I. 81.
- coagulans n.sp., description, (45) 476.
- coli—see also *Bacterium coli*.
 - action on sewage, (47) 490.
 - and *B. aerogenes*, differentiation, (42) 274, 275.
 - as affected by H-ion concentration of medium, (46) 324.
 - bacterial content in milk, (42) 72.
 - communion in meconium of calf, (43) 183.
- coli communis—
 - in milk and cheese, (45) 779.
 - in poultry, (49) 482.
 - longevity in honey, (43) Colo. 164.
 - notes, (46) 684; (48) 44, 584; (49) 201.
 - paper on, (42) 877.
- coli—
 - distribution in water, (42) 275.
 - fermentation products, (48) 107.
 - in ground water, movement, (50) 83.
 - in jellied meats, (42) 254.
 - notes, (47) 153, 547; (49) R.I. 81, Ky. 581.
 - on coconut, (43) 551.
 - stainability as affected by pasteurization, (44) 675.
 - toxicity of various dyes for, (41) 474.
 - viability in carbonated beverages, (46) 754.
- delbrücki, growth rate, (44) 272.
- diphtheriae, studies, (41) 574.
- dysenteriae, longevity in honey, (43) Colo. 164.
- edematiens—
 - antitoxins, standardization, (45) 781.
 - biochemistry of, (43) 880.
 - effect of plant tissue on, (50) 879.
 - prophylaxis, (41) 577.
- enteritidis—
 - as affected by pasteurizing temperature, (45) 380.
 - cause of food poisoning, (46) 571.
 - infection in rats, (43) 275.

Bacillus—Continued.

enteritidis—continued.

- longevity in honey, (43) Colo. 164.
- notes, (44) 183; (48) 584.
- sporogenes in milk, (45) U.S.D.A. 73.

spread of infection, (49) 584, 585.
studies, (42) 885.

virulence and host susceptibility,
(49) 882.

erysipelatis suis, studies, (42) 679;
(45) 888.

fecalis alkaligenes, longevity in honey,
(43) Colo. 164.

flavigena, notes, (49) 201.

fluorescens liquefaciens, notes, (48)
423.

gallinarum, notes, (41) 784; (50) 185.
glässer, serological properties, (47)
586.

granulobacter pectinovorum, studies,
(42) 708.

gummificans, notes, (45) 451.

hemoglobinophilus canis, growth fac-
tors, (47) 564.

histolyticus, effect of plant tissue on,
(50) 879.

hoplosternus, insect susceptibility to,
(42) 153.

influenza—

- effect of potato on, (48) 762.
- growth studies, (46) 78, 79, 80.
- nutrition, (50) 786.
- studies, (41) 574.

jeffersoni, notes, (50) 185.

lactis acidii, *see* Bacterium lactis acidii.

lactis aerogenes—

- fermentation of xylose by, (45) 9.
- longevity in honey, (43) Colo. 164.

larvae—

- control, (49) Wis. 653.
- effect of sodium hypochlorite on,
(49) 156.
- egg-yolk media for, (41) 63.
- notes, (42) U.S.D.A. 857.

lathyri, notes, (44) 642, 648; (46)
447; (48) 743; (50) 547.

lymantriae β n.sp., notes, (41) 357.

lymantricola adiposus n.sp., notes,
(41) 357.

manniticus, notes, (46) 804.

megatherium, cause of souring beef,
(45) 764.

megatherium, food requirements, (45)
465.

melitensis—*see also* Bacterium meli-
tensis and Micrococcus melitensis.

and Bacillus abortus, pathogenic-
ity, (47) 678.

pathogenicity of, (42) 74.

melolonthae liquefaciens affecting
brown-tail moth caterpillars, (44)
550.

Bacillus—Continued.

mesentericus—

in canned asparagus, (46) Kans.
467.

in jellied meats, (42) 254.

in ropy bread, (45) 664.

in unspoiled canned foods, (47)
203.

notes, (43) 261.

ruber, action on sewage, (47) 490.

viability in carbonated beverages,
(46) 754.

vulgatus, on copra, (43) 151.

mucosus capsulatus, growth-promoting
substances of, (50) 664.

murisepticus—

fermentation products, (48) 107.
studies, (43) 785.

musarum n.sp., notes, (46) 850.

mycoides—

culture in sterilized soil, (41) 812.
notes, (48) 423.

necrophorus—*see also* Necrobacillosis.

in swine, (43) 683.

notes, (49) Wis. 681.

nelliae n.sp., description, (48) 741.

nephritidis equi, studies, (42) 680.

nephritis ovis, description, (47) Minn.
383.

"nerve," studies, (43) 472.

noctuarum n.sp., notes, (50) 846.

oedematis maligni, studies, (41) 476;
(43) 385.

oleraceae, notes, (46) 451; (50) 353.

ovisepticus—

notes, (49) 682.

vaccine, for hemorrhagic septic-
emia, (42) Calif. 884.

vaccines from, use, (47) 681.

panis in evaporated milk, (44) 777.

parabotulinus—

notes, (48) 181.

specific identity, (48) 678; (50)
584.

paratyphi alvei n.sp., description, (47)
259, 260.

paratyphosus—

A and B in hog cholera blood, (43)
884.

A and B, longevity in honey, (43)
Colo. 163

A and B, notes, (48) 584.

A, as affected by pasteurizing tem-
perature, (45) 380.

A in swine, studies, (42) 882.

B, cause of epizootic among guinea
pigs, (47) 183.

B, enzootic due to, (50) 586.

B in swine, studies, (42) 882.

B, notes, (43) Ind. 385.

B, virulence and host susceptibil-
ity, (49) 882.

fermentation of xylose by, (45) 9.
nature and systematic position,
(47) 586.

Bacillus—Continued.

- paratyphosus—continued.
 - viability in carbonated beverages, (46) 754.
- perfringens—
 - antitoxins, standardization, (45) 781.
 - notes, (44) 373.
 - production of antiserum to, (44) 277.
- pertussis, studies, (41) 574.
- pestis caviae—
 - notes, (48) 84.
 - virulence and host susceptibility, (49) 882.
- pestis, notes, (44) 183.
- pfaffi n.sp., description, (42) 478.
- pfaffi, notes, (50) 185.
- phytophthorus—
 - notes, (47) S.Dak. 448.
 - viability, (49) Nebr. 751.
- pieris, characteristics, (41) 552.
- pluton, studies, (43) U.S.D.A. 58.
- prodigiosus—
 - as transformer of cyanamid, (42) 428.
 - complement inactivation by, (41) 376.
- proteus, biochemistry, (41) 477.
- proteus vulgaris—
 - in jellied meats, (42) 254.
 - longevity in honey, (43) Colo. 164.
- pyocyaneus—
 - action on sewage, (47) 490.
 - rôle in swine pneumonia, (43) 688.
 - toxicity of various dyes for, (41) 474.
 - value of chloramin T against, (44) 476.
- pyogenes—
 - infection in bucks, (42) Calif. 884.
 - notes, (45) 885; (46) 777; (48) Minn. 179; (50) 881.
 - relation to abortion disease, (41) 779.
 - studies, (43) 581.
- radicicola—*see also* Nodule bacteria.
 - cross-inoculation, (41) 523.
 - culture in sterilized soil, (41) 812.
 - effect of low temperature on, (42) N.Y.Cornell 435.
 - longevity, Mo. (43) 721; (46) 315.
 - studies, (41) Ga. 130, 720, 832; (43) 30, 514; (44) 730.
 - viability, (41) Mich. 633.
- radiobacter, studies, (44) 730.
- Reading, and B. sporogenes, comparison, (42) 271.
- rettgeri—
 - n.sp., description, (42) 478.
 - notes, (50) 185.
- sanguinarium, studies, (41) 580; (50) 82, 185.

Bacillus—Continued.

- septicaemiae, notes, (49) R.I. 81.
- solanacearum—*see also* Bacterium solanacearum.
 - new host plants, (49) 144.
 - notes, (43) 243; (45) 842; (46) 451; (48) 352; (49) 149; (50) U.S.D.A. 47.
 - on tobacco, (44) 449.
 - on tomato, (43) 154.
- solanisaprus, notes, (49) 46.
- sotto and B. bombycis, differentiation, (44) 353.
- sphingidis n.sp., notes, (50) 845.
- sporogenes—
 - and Reading bacillus, comparison, (42) 271.
 - growth and biochemical activities, (50) 785.
 - heat resistance of, (49) 163.
 - notes, (46) 684.
 - proteolytic action, (41) 476.
 - serologic agglutination, (49) 880.
- suberis, provisional name, (50) 788.
- subtilis—
 - action on sewage, (47) 490.
 - and Streptococcus lacticus in milk, (44) 872.
 - as affected by potassium mercuric iodid, (44) 275.
 - as transformer of cyanamid, (42) 428.
 - effect of ether on, (41) 524.
 - in canned asparagus, (46) Kans. 467.
 - in jellied meats, (42) 254.
 - in unspoiled canned food, (47) 203.
 - respiration, (43) 820; (48) 124.
 - stainability as affected by pasteurization, (44) 675.
 - studies, (41) 632; (44) 205.
 - utilization of nitrogen by, factors affecting, (45) 28.
- suipestifer—
 - as affected by pasteurizing temperature, (45) 380.
 - infection of food with, (47) 170.
 - longevity in honey, (43) Colo. 164.
 - morphology and biology, (45) 286.
 - mutation among, (49) 884.
 - notes, (43) Ind. 385; (46) Ind. 583; (48) 468, 482, 485, 584.
 - relation to polyneuritis in pigeons, (41) 265.
 - serological properties, (47) 586.
 - studies, (42) 882; (45) Ind. 176.
- suisepiticus—*see also* Bacterium suisepiticum.
 - in swine lungs, (47) 684.
- teres, notes, (46) 777.
- tetani—
 - and B. perfringens, combined antiserum to, (44) 277.
 - cultivation and isolation, (43) 880.
 - detection, (44) 580.

Bacillus—Continued.

- tetani—continued.
 - growth and biochemical activities, (50) 785.
 - growth in presence of tuberculin, (41) 877.
 - in soil and on vegetables, (49) 863.
 - pathogenicity, relation to calcium ions, (41) 83.
 - studies, (41) 876.
 - tetanoides, studies, (41) 476.
 - timothy 213, growth-promoting substances of, (50) 664.
 - toxicogenic, from cheese, (41) 169.
 - tracheophilus—
 - insect relations to, (45) 543.
 - studies, (42) 855; (43) U.S.D.A. 245, Tex. 846.
 - truffauti n.sp., description, (49) 213.
 - tuberculiigenus columbarum, notes, (45) 787.
 - tuberculosis, *see* Tubercle bacilli.
 - typhosus—
 - as affected by pasteurizing temperature, (45) 380.
 - attenuated, agglutinability, (43) 581.
 - culture media for, (41) 680.
 - fermentation of xylose by, (45) 9.
 - immunity, inheritance, (50) 783.
 - longevity in honey, (43) Colo. 163.
 - vascularum, notes, (43) 548.
 - viscosum equi, notes, (49) Ky. 581.
 - viscosus, notes, (43) 261.
 - voldagsen, serological properties, (47) 586.
 - von Hibler IX, studies, (41) 476.
 - vulgaris, action on sewage, (47) 490.
 - vulgaris, notes, (48) N.J. 345.
 - walfischrauschbrand, studies, (43) 111.
 - welchii—
 - description, (43) 275.
 - fermentation products, (48) 107.
 - haemotoxin and its neutralization, (47) 285.
 - in milk, toxic properties, (42) 875.
 - notes, (41) 877; (46) 684.
 - pathogenicity, relation to calcium ions, (41) 83.
 - prophylaxis, (41) 577.
 - proteolytic action, (41) 476.
 - toxin, precipitation of (43) 881.
 - xerosi, notes, (43) 472.
- Backwater curves and hydraulic jump, theory, (42) 181.
- Bacon—
- curing, (41) 488, 617.
 - curing, English methods, (49) 470.
 - curing on the farm, (49) 272.
 - curing, sugar substitutes for, (44) U.S.D.A. 557.
 - digestibility, (41) 467.
 - gastric response to, (41) 857.
 - hog raising, principles, (50) 575.

Bacon—Continued.

- production, value of first cross in, (49) 170.
 - soft oily, cause and prevention, (50) 172.
- Bacteria—*see also* Microorganisms and Organisms.
- acetone-extracted, antigenic properties, (47) 284.
 - acid-fast, studies, (42) 177.
 - acid production by, agar slants for detecting, (46) N.Y.State 431.
 - action of salts and ions on, (45) 75.
 - action of sunlight on, (41) 681.
 - action on manure, (48) N.Y.State 20.
 - anaerobic, *see* Anaerobes.
 - and protozoa, pathogenic, textbook, (42) 878.
 - and vitamins, (50) 769.
 - as affected by concentration of sugar solutions, (42) 627.
 - as affected by formaldehyde vapor, (41) 154, 245.
 - as source of vitamin B, (46) 760.
 - behavior toward arsenic, (41) 376.
 - bipolaris septicus group, antigenic relations, (48) 178.
 - butyric acid-forming, in Swiss cheese, (49) 679.
 - cause of deterioration of sugars, (46) 206, 417, 418.
 - causing denitrification of cellulose, (45) 821.
 - cellulose, attacking peat, (44) 814.
 - classification, (44) 517.
 - classification and nomenclature, (41) 821.
 - classification chart, (47) 526.
 - colon-aerogenes group, correlation, (43) 791.
 - complement inactivation by, (41) 376.
 - counting by microscope, (44) N.Y. State 95.
 - cultural requirements, (47) 584.
 - culture, collodion sacs for, (48) 311.
 - effect on etching power of roots, (43) 422.
 - effect on perithecia formation, (42) 131.
 - effect on rate of decaying wood, (44) 26.
 - evolution, (41) 821.
 - fermentative activity, (46) N.C. 740.
 - fermenting carbohydrates, identification, (43) 113.
 - for humus fertilizing compounds, (47) 319.
 - from decomposing salmon, (44) 557.
 - gelatin liquefaction by, (50) 526.
 - generic names and descriptions, (45) 427.
 - Gram staining, procedure, (49) N.Y. State 731.
 - growth as affected by—
 - pH, (41) 410; (47) 502.
 - plant tissue substances in media (47) 425.

Bacteria—Continued.

- growth as affected by—continued.
 - salts, (47) 524.
 - vacuum, (47) 203.
 - vitamins, (46) 80, 866.
- growth in sterilized soil, (41) 812.
- growth, nutritional factors in, (48) 559.
- growth promoting properties, (50) 664.
- growth, salt effects in, (48) 432, 828.
- hemoglobinophilic, occurrence and classification, (50) 478.
- in dairy products, effect of carbon dioxid, (47) Ill. 180.
- in frozen soils, (43) 422.
- in home-canned foods, (46) 859.
- in milk, *see* Milk.
- in pure cultures, determination of number, (43) 274.
- in ripening corn silage, (45) 169.
- in soils, *see* Soil bacteria.
- in stomach as affected by saliva, (46) 862.
- in suspension, estimating number, (43) 274.
- in tomato products, counting, (44) 11, 12.
- in water, *see* Water.
- increasing etching effect of roots on marble, (42) 25.
- inheritance of acquired characters, (47) 125.
- intestinal, factors affecting, (48) 164; (49) 561.
- intestinal, synthesis of antineuritic vitamin by, (48) 363.
- iron-depositing, studies, (42) 575.
- lactic acid, biology, (47) 79; (48) 275.
- lactic acid, monograph, (43) 680.
- legume, movement in soil, (48) 212.
- life cycles, (49) 221; (50) 728.
- luminous, growth as affected by irradiation, (45) 525.
- metabolism as affected by media, (48) 107.
- methods of culture, technique, (46) N.C. 740.
- milk-fermenting, studies, (47) 282.
- morphology and biology, (50) 526.
- natural grouping, (45) 630.
- nitrate-reduction test, (42) N.Y.State 325.
- nitrifying, relation to reactions and concentrations of media, (50) 516.
- nitrifying, studies, (43) 216.
- nitrogen-fixing, nonsymbiotic, (42) 18.
- nutrition, studies, (41) 264; (46) 78; (50) 786.
- of dysentery group, volatile fatty acids produced by, (45) 311.
- on bedding, effect of milk, (44) 74.
- oxidizing sulphur, (48) 816.
- pathogenic—
 - air carriage of, (46) 773.
 - as affected by vitamins in animal tissues, (41) 574.
 - in hog cholera blood, (43) 884.

Bacteria—Continued.

- pathogenic—continued.
 - physiology, (46) N.C. 739.
 - to plants in Philippines, identification, (48) 741.
 - pentose-destroying—
 - aldehyde production by, (44) 610.
 - fermentation characteristics, (43) 411; (46) 503.
 - fermentation products, (48) 108.
 - potassium requirements, (41) 523.
 - preservation of stock cultures, (45) 178.
 - propionic, action in cheese, (47) 678.
 - reaction to chemical treatment, (49) 818.
 - relation to soil productivity, (43) 124.
 - removal from drinking water by chlorine gas, (50) 590.
 - resistance to sterilizing agents, (41) 821.
 - respiration studies, (41) 524.
 - rôle in plant diseases, (43) 444.
 - spore-bearing, in unspoiled canned foods, (47) 203.
 - spores, single, isolating, (45) 339.
 - sulphur-oxidizing—
 - action in alkali soil, (49) 625.
 - growth and respiration, (50) 517.
 - isolation, (47) 220.
 - symbiotic, morphology, (48) 432.
 - thermal death point, relation to pH, (46) N.C. 740.
 - thermal death time curves, (46) 561.
 - thermophilic, studies, (45) 10, 338.
 - tolerance for arsenic, (44) 77.
 - tolerance to acids, (46) N.C. 740.
 - toxicity of various dyes for, (41) 474.
 - transmutation, (43) 274.
 - uric or hippuric acid, (45) 630.
 - vitamin requirements, (46) 759.
- Bacterial—
- count, determining, technique, (49) 309.
 - count of dishes, hand-washed v. machine-washed, (45) 62.
 - cultures—
 - Gram stain, modification, (44) 730.
 - H-ion concentration, (41) 410, 503; (43) 383.
 - number of colonies for soil plate, (43) 422.
 - petri plates, time of incubation, (43) 422.
 - reduction potentials, (43) 421.
 - emulsions, nephelometric determination, (46) 312.
 - fertilizers, analyses, (43) 424.
 - flora—
 - and intestinal obstruction, (44) 66.
 - of eyes of horses, (43) 472.
 - of rats on vitamin A deficient diet, (48) 260.
 - of reproductive organs of cow, (43) 182.

Bacterial—Continued.

flora—continued.

of uterus and meconium of calf,
(45) Mich. 284.

infection—

relation to polyneuritis, (50) 770.

relation to vitamin C, (49) 461.

spread, (49) 584, 585.

infections—

calcium-ion factor, (41) 83.

chemotherapy, (41) 476.

inhibition by metabolic products, (46)
324.

metabolism, studies, (49) 609, 610.

stain, rose bengal, (46) N.Y.State 431.

suspensions—

determining number, (46) 412;
(50) 680.standardization, (44) 477; (45)
177.

tumors and wound calluses, (42) 435.

Bactericidal power of vegetable juices,
(42) 7.

Bacterins—

autogenous, for sterility, (44) 581.

immunizing value, Nebr. (43) 882, 887.

Bacteriological—

culture media, *see* Culture media.

experiment station in Italy, (47) 195.

laboratory for cooperative creameries,
(43) 879.

Bacteriology—

agricultural, (46) 124.

agricultural and industrial, textbook,
(47) 9.

agricultural, textbook, (49) 819.

agricultural, treatise, (46) 221; (50)
526.and animal diseases, treatise, (44)
678; (49) 177.and serology, technique and methods,
treatise, (50) 180.international catalogue, (43) 227; (46)
222.

laboratory manual, (46) 201.

manual, (41) 184, 874; (46) 578.

of foods, treatise, (41) 360.

pharmaceutical, (45) 477.

principles, textbook, (46) 374.

soil, teaching, (47) 97.

textbook, (42) 474; (44) 576; (45)
578; (49) 125, 625; (50) 478.

treatise, (45) 780; (46) 78, 880.

veterinary, treatise, (48) 773.

Bacteriolysins, production, effect of vitamin
deficiency, (49) 279.

Bacteriolysis, studies, (41) 187.

Bacteriophage, rôle in immunity, (48) 675.

Bacteriophagus microorganism, rôle in fowl
typhoid, (43) 84.

Bacteriosis—

of banana, (46) 850.

studies, (49) 651.

Bacterium—

abortivo-equinus, action on carbohy-
drates, (44) 578.

Bacterium—Continued.

abortum—*see also* *Bacillus abortus* and
Abortion.and *Bacterium melitensis*, com-
parison, (46) 775.

cultivation, (47) 679.

equi, notes, (49) 283.

growth, effect of carbon dioxid
tension, (46) 277.importance in abortion, (49) Calif.
79.

in swine and rabbits, (49) 477.

notes, (46) Mo. 378.

pathogenicity for monkeys, (46)
775.

paths of infection, (49) 179.

rapid method of cultivation, (50)
Minn. 181.strains, comparative pathogenicity,
(47) Mich. 584.

studies, Mich. (44) 878, 879.

susceptibility of swine, (46) Mich.
582.

acidi propionici (d)—

action, (50) 279.

notes, (45) 779; (47) 678; (50)
109, 205.

anatum n.sp., description, (42) 779.

angulatum—

and *Bacterium tabacum*, compari-
son, (47) Conn.State 545.

description and control, (49) 647.

fermentative activity, (46) N.C.
740.notes, (43) 246; (44) Va. 746;
(48) Va. 246; (49) 545.

apii, control, (50) 651.

aracoli, notes, (49) R.I. 81.

arsenoxydants—

behavior toward arsenic, (44) 78.

n.sp., description, (42) 76.

arsenreducens—

behavior toward arsenic, (44) 78.

n.sp., description, (42) 77.

atofaciens n.sp., description, (42) 844.

avisepicum, studies, (48) Calif. 584.

bipolaris, antigenic value of vaccines
against, (43) Nebr. 882.bovisepicum, studies, (47) 183; (48)
279.

campestre—

fermentative activity, (46) N.C.
740

notes, (45) 446.

seed transmission of, (45) 542.

cannae n.sp., notes, (45) 250.

casei, culture in sterilized soil, (41)
812.casei, mannitol production by, (46)
804.casei ϵ , growth rate, (44) 272.casei δ , studies, (44) 273.citri, *see* Citrus canker.

Bacterium—Continued.

citriputeale—

- and *Bacterium citrarefaciens*, identity, Calif. (47) 650; (48) 542.
- relation to weather, (50) 752.
- synonymy, (46) 244.

cloacae in decomposing salmon (46) 754.

coli—*see also* *Bacillus coli*.

- commune, notes, (46) 777.
- growth as affected by salts, (47) 524.
- growth, relation to pH, (48) 432.
- growth, salt effects on velocity, (48) 828.

coronafaciens n.sp., description, (43) 545.

delendae-muscae n.sp., description, (50) 455.

erysipalatis-suis, notes, (47) 587.

exitiosum—

- n.sp., notes, (45) 248.
- notes, (47) Pa. 445.

flaccumfaciens n.sp., description, (47) 148.

flaccumfaciens, notes, (49) 751.

gallinarum, notes, (49) R.I. 81.

glycineum n.sp., description, (42) 352.

glycineum, notes, (45) 545; (46) N.C. 740; (48) 48, 453.

gummis, notes, (45) 653.

hederae n.sp., notes, (45) 54.

herbicola, notes, (43) 445.

ichthyosmius—

- biochemical action, (42) N.Y.Cornell 565.

effect on keeping quality of butter, (50) 476.

- notes, (43) N.Y.Cornell 470; (50) Wis. 280.

jeffersonii n.sp., description, (42) 478.

juglandis, notes, (41) 450, 453; (43) 152.

lachrymans, notes, (44) Conn.State 150; (48) U.S.D. A. 46.

lactis acid—

- inoculation of corn silage with, (44) 175.

inoculation of sauerkraut with, (46) 502.

stainability as affected by pasteurization, (44) 675.

volatile acidity, (43) Iowa 75.

maculicolum on crucifers, (43) 152.

malvacearum—

- control, Ariz. (48) 449, 452.

description, (48) 741.

notes, (41) S.C. 50; (43) 243, 652; (45) Ark. 353; (46) 544.

marginatum n.sp., description, (45) 752.

melitensis—*see also* *Micrococcus melitensis* and *Bacillus melitensis*.

- and *Bacterium abortum*, comparison, (43) 880; (46) 775.
- pathogenicity for monkeys, (46) 775.

Bacterium—Continued.

melitensis—continued.

serologic grouping of, (43) 879.

studies, (41) 778; (49) 380.

melleum n.sp., studies, (49) 248.

nephritidis ovis, notes, (45) 887.

panici n.sp., description, (50) 550.

paratyphi abortus equi, notes, (49) 481.

pelargoni n.sp., proposed name, (49) 250.

phaseoli—

and *Bacterium flaccumfaciens*, differentiation, (47) 149.

notes, (41) 450; (44) Oreg. 841.

sojense, notes, (48) 48.

studies, (42) 351; (45) Okla. 351.

systemic nature, (48) 545.

pneumointes, effect of plant tissue on, (50) 879.

prodigiosum, notes, (49) 151.

pruni, notes, (43) Okla. 36.

pullorum—

detection, (42) Calif. 885.

infection, (41) Conn.Storrs 880; (46) Mass. 81.

infection, diagnosis, (48) Mass. 382.

infection, effect on hatchability of eggs, (50) 685.

infection, nature of, (48) Mass. 778.

intradermal test for, (41) 88; (43) 683.

notes, (41) 580; (48) 883; (50) 82, 185.

puttemansi n.sp., notes, (49) 545.

pyocyaneum, notes, (46) 777.

pyogenes, notes, (47) 587.

rhusiopathiae, notes, (47) 587.

sanguinarium, notes, (43) 84; (48) Mass. 382.

sojiae n.sp., description, (45) 545.

sojiae, notes, (41) N.C. 656; (46) N.C. 740; (48) 453.

solanacearum—*see also* *Bacillus solanacearum*.

additional hosts for, (50) 746.

description, (48) 741.

notes, (42) 148, 351; (43) 245, Pa. 549; (45) 352; (47) Pa. 445, 838; (48) 646; (49) 149; (50) 347, 550.

sp. on celery, (41) N.J. 50.

suipestifer, notes, (49) R.I. 81.

suisepticum—*see also* *Bacillus suissepticus*.

and swine pneumonia, (47) 80, 884.

pathogenicity for hogs, (48) 380.

studies, (48) 777.

tabacum—

and *Bacterium angulatum*, comparison, (47) Conn.State 545.

control, (48) Wis. 744.

description and control, (49) 647.

effect of temperature, (50) 41.

Bacterium—Continued.

tabacum—continued.

fermentative activity, (46) N.C. 740.

notes, (43) 246; (47) Conn.State 544; (48) Va. 246, N.C. 350, Mass. 643, Fla. 646, Mass. 847; (49) 545, Wis. 643, Fla. 838; (50) 749.

teutlium on sugar beets, (46) 450.

translucens—

remedies, (42) 644.

undulosum on wheat, (41) 246.

trifoliorum n.sp., description, (50) 349.

tularensis—

cultivation, amino acid cystin in, (49) 784.

cultivation on new media, (47) 486; (49) 455.

studies, (42) 476; (46) 151, 662; (47) 559.

tumefaciens—

behavior on rubber, (48) 747.

notes, (43) 246, 444; (44) 248, 346; (45) 647, 751; (46) 543; (47) 45, 548; (49) 820.

studies, (42) 435, 841; (43) 242; (45) 647; (46) 49; (48) 843; (50) 42, 745.

typhosum, viability in carbonated beverages, (46) 754.

vascularum, notes, (44) 51; (45) 443; (46) 45, 148, 242; (47) 48; (49) 539; (50) 351.

vascularum on sugar cane, (46) 450.

vesicatorium—

n.sp., description, (45) 849.

notes, (48) 741.

vignae n.sp., description, (49) 246.

viridifaciens n.sp., description, (50) 45.

viscosum equi in foals, (44) 280.

vitians, studies, (42) Ohio 845.

volutans, notes, (46) 617.

vulgare, notes, (46) 777.

Bactrocera cucurbitae, control, (43) 455.

Bacury kernels, oil from, analyses, (47) 803.

Bagasse—

analysis, rotary digester for, (46) 15.

char, preparation and standardization, (47) 717.

decolorizing carbon from, (41) La. 416.

fertilizing value and analyses, (42) 223.

paper, use in weed eradication, (45) 438.

paper-making qualities, (41) 806.

poisoned, for soil grubs, (44) V.I. 356.

preservation for analysis, (44) 807.

Bagnisiopsis dioscoreae—

n.sp., description, (41) 749.

n.sp., on yams, (43) 652.

notes, (48) 45.

Bagworms—

campaign against, (45) 854.

control, (46) 247; (47) 361.

Bagworms—Continued.

new parasites of, (47) 657.

notes, (41) 755.

on citrus, (43) 555.

popular account, (43) Mo. 160.

South African, (42) 360.

Bahia grass, culture experiments, (43) 528.

Bakauan, cultivation for firewood, (42) 142.

Bakeries, economic operation, (42) N.Dak. 458.

Bakerophoma sacchari, notes, (46) 45.

Baker's mealybug—

control, (47) Calif. 653.

notes, (47) 657.

Bakewell, R., work in animal production, (46) 872.

Baking—

club manual, (49) Ill. 494.

in the home, (44) U.S.D.A. 761.

Baking powder—

analysis, (41) N.Dak. 763; (43) 415, Conn.State 859.

analysis, official method, (44) 9.

carbon dioxid in, (47) 205, 408.

ingredients and standards, (43) 415.

papers on, (41) 66.

teaspoonful, weight, (48) 159.

Baking powders—

preparation, (42) 363.

working action, (50) 852.

Baking technology, laboratory manual, (49) 114.

Balaninus rectus, *see* Chestnut weevil.

Balanophora on coffee, (46) 343.

Balansia—

cyperi n.sp., description, (46) 344.

genus, notes, (43) 152.

Balantidium coli suis, infection in sheep, (45) 385.

Balata industry in British Guiana, (41) 501.

Ballistite—

for rock and soil blasting, (43) 480.

use in agriculture, (45) 891.

Balloon—

flight, observations on, (43) U.S.D.A. 719.

racing, (45) U.S.D.A. 17.

Balloons, pilot, studies, (44) U.S.D.A. 717.

Balsa—

analyses, (48) 416.

logs, infestation with lepidopterous larvae and pupae, (41) 660.

Balsam—

Canada, witches' broom, (45) 548.

culture and preparation of products, (50) 140.

determination of future yields in Canada, (42) 445.

diseases, (46) 454.

fir butt rots, (45) 548.

fir, dying, in Minnesota, (49) 254.

fir, micorrhizas on, (48) 725.

of Peru, chemical constants, (43) 116.

Oregon fir, (41) 541.

poplar, root habit, (41) 634.

root development, (48) 42.

Balsam—Continued.

- seed, collecting and storing, (45) 838.
- windfall injuries, (46) 645.
- Balsamocitrinae, notes, (41) 432.
- Balsams, analysis, (44) 806.

Bamboo—

- alcohol from, (47) 207.
- disease survey in India, (46) 544.
- grass, culture in Florida, (41) Fla. 37.
- new chalcid attacking, (49) 255.

Bamboos—

- artificial raising, (44) 149.
- as forage crop, (44) 527.
- as paper-making material, (41) 732; (44) 743.
- growth rate, (44) 518.
- method of working in India, (42) 44.
- Philippine, notes, (48) 842.
- vascular anatomy, (50) 728.

Banana—

- aphid, notes, (49) 451.
- bacteriosis, (46) 850.
- beetle borer, studies, (46) 751; (47) 259; (48) 254.
- blood disease in Celebes, (47) 50.
- bunchy top, notes, (46) 453; (49) 150.
- disease—
 - in Cuba, (42) 49.
 - in Dutch East Indies, (49) 149.
 - in Porto Rico, (46) 48.
 - in tropical America, (42) 49.
 - notes, (44) 247.
- diseases, notes, (47) 838.
- flour, characteristics and detection, (41) 467.
- flower bud, vitamin C in, (49) 563.
- freckle disease, notes, Hawaii (41) 153; (44) 47; (46) 647.
- freckle in Philippines, (50) 752.
- industry, (47) 41; (48) Hawaii 338.
- insects of Porto Rico, (47) 847.
- meal, preparation, (41) 64.
- mealybug, notes, (41) 756.
- must, fermentation, (41) 715.
- Panama disease, notes, (43) 48, 151; (44) 53, 746; (47) 50, 147; (48) 744.
- root borer—
 - habits and remedies, (43) 457, 560.
 - in Fiji, (44) 258; (46) 245.
 - notes, (42) 451, 857; (43) 52, 457, 560; (48) 252, 254; (49) 550.
 - studies, (45) 559; (46) 751; (47) 259, 659; (50) 661.
- root disease, notes, (45) 843; (46) 746.
- stem weevil, life history, (42) 857.
- stems, fiber value, (49) 329.
- supposed nematode disease, (45) 356.
- weevil, studies, (47) 659.
- weevils of California, (47) 659.
- wilt in Philippines, (46) 745.
- wilt, notes, (41) 845; (43) 848; (44) 746.
- wilt on manila hemp, (50) 549.
- wilt resistant varieties, (44) P.R. 442.

Bananas—

- African, reversion in, (45) 630.
- antiscorbutic value, (42) 257; (45) 466.
- as affected by ultra-violet rays, (43) 731.
- as paper-making material, (41) 732.
- California-grown, analyses, (47) Calif. 660.
- coconut butterfly on, (42) 751.
- culture, (42) Guam 37, 736; (43) 40, 837; (45) Guam 43, 44, 643.
- culture in Belgian Congo, (45) 347.
- culture in Fiji, (43) 40.
- culture in Porto Rico, (45) 838.
- drying, (41) 557; (43) 564; (45) Calif. 808.
- feeding value, (46) Hawaii 679.
- fertilizer experiments in India, (42) 517.
- fertilizer sprays for, (41) Hawaii 148.
- improvement, (45) 228.
- insects affecting, (42) 451; (43) 52; (45) 656; (47) 848.
- nutritive value, (42) 457.
- Philippine, food value, (48) 654.
- Philippine, studies, (42) 443.
- respiration, nature of, (49) 56.
- studies in India, (46) 640.
- sucrolytic action, (45) 715.
- sugar cane borer on, (41) 660.
- treatise, (45) 837.
- variety tests, (46) Guam 734.
- vitamin C in, (47) 268.
- Bandelier National Monument, interesting features, (49) U.S.D.A. 342.
- Bank—
 - agricultural department, treatise, (49) 295.
 - loans to farmers, (46) U.S.D.A. 786.
 - swallows' nests, insect fauna, (41) 56.
- Bankers' advances against produce, (49) 390.
- Barajillo, culture, (45) 737.
- Barber, Ohio C., Agricultural and Industrial School, notes, (42) 696.
- Barberry—
 - and black rust in Wales, (48) 145.
 - destruction with chemicals, (49) U.S.D.A. 146.
 - dissemination, (47) 751.
 - distribution in Pennsylvania, (47) 328.
 - eradication, (42) 542; (43) 45, 546; (44) Mont. 341; (45) 46; (46) Mont. 343, 447, U.S.D.A. 546; (47) Minn. 347; (48) N.Dak. 44; (49) Mont. 146, U.S.D.A. 146.
- eradication—
 - in Illinois, (46) 546.
 - in Iowa, (45) 49.
 - in South Dakota, (48) 346.
 - in Wisconsin, (42) 742; (50) Wis. 649.
 - progress, (50) 649.
 - in Iowa, history, (46) 449.

Barberry—Continued.

infection by sporidia of Puccinia, (48) 842.

inheritance of germinal peculiarities, (45) 335.

relation to wheat rust, (41) U.S.D.A. 346, Wis. 842; (43) 546, Iowa 653; (44) Wis. 241, 444; (45) 747.

rusts, morphological study, (43) 844. survey, (48) Can. 450.

survey, in Kansas, (44) Kans. 242.

Swazey, description, (47) 41.

varieties, relation to rust, (41) 747.

Barcelona nuts, vitamin A in, (44) 765.

Barges, insulated and refrigerator for perishable foods, (49) 889.

Baris—

chlorizans on cabbage, (44) 657.

spp. on cabbage, (50) 851.

Barium—

calcium, and strontium salts, differentiation, (45) 206.

carbonate, toxicity to rats, (44) U.S. D.A. 248.

chlorid—

effect on soil permeability, (47) 20.

effect on starch, (47) 128.

use to prevent nitrogen loss from manure, (44) 817.

in Hagerstown soil, (49) 617.

in plants, (46) Colo. 28.

in plants and soils, (43) Ky. 327.

phosphate, fertilizing value, (42) R.I. 527, 814.

phosphomolybdate, determination, (43) 804.

process in sugar manufacture, (46) 616.

water sprays, fungicidal value, (43) U.S.D.A. 843.

Bark beetles—

combating in Switzerland, (47) 555.

control, (44) Oreg. 166.

control in British Columbia, (46) 159.

control in eastern Canada, (47) 761.

new, descriptions, (46) Miss. 461.

new, from Colorado, (50) 453.

outbreak of, (48) Calif. 550.

review of literature, (50) 255.

studies, (46) 560; (48) Miss. 652.

trap-tree methods for, (45) 656.

Bark borer—

flat-headed, notes, (41) 166.

injurious to cypress, (47) 855.

six-toothed, of spruce, (47) 258.

Barley—

absorption of soil constituents, (42) 23.

absorption of water and nitrates, (49) 29.

Alpine, cultural and breeding tests, (45) 735.

amino-acid content, (41) 367.

analyses, (44) Ariz. 568.

analyses and use as feeding stuffs, (45) 373.

Barley—Continued.

and oats, culture experiments, (47) Minn. 331.

and oats, yielding capacity, (48) 830. and peas for fattening pigs, (45) Idaho 271.

and wheat, yielding capacity, (48) 831.

antiscorbutic value, (42) 463.

aphis, natural control, (41) 62, 852.

as affected by—

alkali salts, (41) 322, 623.

aluminum, (41) 214.

ammonia nitrogen, (41) 815.

calcium, (44) 512.

carbon dioxid, (44) 218, 725.

chromium salts, (46) 716.

Hessian fly (41) Kans. 34.

manure, (41) 322.

neutral phosphate, (49) 517.

potash, (49) 817.

potassium chromate, (48) 323.

salt, (45) 586; (48) Calif. 515, Calif. 524.

sodium arsenite, (41) 625.

sulphur, (45) 26; (46) Wash. 427, 428.

superphosphate, (47) Minn. 124.

weather, (47) Minn. 116; (49) 115.

as green manure, (46) 320.

as hay crop, (41) Alaska 30; (43) 527; (44) Alaska 327, Alaska 328; (47) Calif. 631.

as nurse crop, (43) Wash. 737; (47) Ohio 137; (48) N.Dak. 29.

as supplement to alfalfa pasture, (42) U.S.D.A. 374.

as wheat substitute, (44) U.S.D.A. 761.

ash content, (46) 329.

bacteriosis, notes, (45) 542.

blight, relation to wheat black chaff, (41) 246.

bran, value for milk production, (42) Wis. 376.

breeding—

dominant Mendelian characters, (46) 438.

experiments, (41) Alaska 31, Minn. 732; (42) Minn. 824; (44) Alaska 327, Alaska 329, Alaska 521, 526; (45) Okla. 431; (46) 633; (47) Calif. 648, Okla. 824; (48) Mich. 224, 434, S.C. 629; (49) 329, Idaho 732; (50) 28, Minn. 132.

in Sweden, (50) 735.

brewing value, relation to nitrogenous matter in, (49) 31.

certification in Germany, (50) 439.

characters, factor analysis, (41) 639; (42) 32.

chop, analyses, (42) Tex. 769; (45) Tex. 68; (46) Can. 167, Tex. 675.

climatic requirements, (41) U.S.D.A. 417.

Barley—Continued.

- Colless, description, (47) Colo. 632.
 composition as affected by soils and fertilizers, (41) 422.
 continuous culture experiments, (41) 826; (42) 98.
 cost of production, (41) Minn. 91; (44) N.Dak. 88, N.Dak. 190, U.S.D.A. 789; (50) Can. 592.
 covered smut, control, (49) 646; (50) 347.
 crosses, smooth-awned, (47) Minn. 331.
 cultural directions, (46) Wash. 437.
 culture—
 experiments, (41) Nebr. 36, Ariz. 332, Can. 528, Mich. 636, Mo. 637, N.Dak. 824; (42) 132, N.Dak. 732; (43) Mont. 332, Nebr. 637, Mont. 739; (44) N.Dak. 31, Alaska 328, Alaska 522, 526, 527, 632; (45) 35, 630, N.Dak. 225, N.Dak. 226, Mont. 339, U.S.D.A. 530, N.Dak. 734; (46) 436, U.S.D.A. 724; (48) N.Dak. 30, N.Dak. 225, 227, Ariz. 434, Can. 450, 629, 630; (49) Tex. 429; (50) Can. 231, Alaska 532, 637.
 experiments in China, (42) 400.
 experiments on citrus soil, (49) 516.
 in British Columbia, (42) 733.
 in California, (42) Calif. 32.
 in Chile, (41) 827.
 in Mesopotamia, (44) 232.
 in Morocco, (49) 595.
 in South Africa, (41) 528.
 in South Australia, (41) 639.
 in South Dakota, (41) S.Dak. 435.
 on peat soil, (46) 216.
 on sandy soils, (41) Wis. 18.
 on Yuma project, (43) U.S.D.A. 393.
 damage, (44) U.S.D.A. 118.
 detection in feeds, (50) 468.
 dietetic value, (47) 668.
 digestibility coefficients, (48) 574.
 disease survey in India, (46) 544.
 diseases, (42) Mich. 694; (43) Tex. 845; (44) 232; (45) 444.
 diseases and pests, (46) 52.
 dwarf forms in, (47) Miss. 825.
 dwarf, many-noded, (48) 832.
 early growth in alkali soil, (42) Utah 28.
 effect of—
 carbon dioxid, (42) 816.
 drainage, (42) Wis. 384.
 fallowing, (48) Minn. 322.
 number of plants per hill, (41) N.J. 36.
 osmotic pressure on cell sap, (43) 224.
 position of grain, (41) N.J. 36.
 soil acids, (42) Wis. 324.
 soil and season, (50) 233.

Barley—Continued.

- effect on following crop, (44) R.I. 31; R.I. 33, Calif. 731; (45) N.Dak. 226.
 effect on oxidation in soil, (47) 213.
 electroculture experiments, (50) 131.
 energy value, (47) 69.
 exotic, tests in Algeria, (45) 35.
 feed, analyses, (41) Conn.State 176, Can. 564, Ind. 564, R.I. 564, N.Y. State 868; (42) Mich. 63, 263, 560, N.H. 769; (43) Ind. 69, Ky. 373, 867, Ind. 867; (44) Mass. 671, N.H. 671; (45) N.Y.State 469, 872; (48) 68.
 feed, value for milk production, (42) Wis. 376.
 feeding methods, (50) Mont. 171.
 feeding value, (42) Mont. 67, Calif. 868; (46) 674; (47) 278; (48) 75; (50) Can. 370.
 fertilizer experiments, (41) N.J. 22, N.J. 23, N.Dak. 140, 228, 229, 425, Can. 528, N.Dak. 823, 826; (42) 223, 327; (43) 232; (44) 24, 128, 317, Minn. 321, 528, 815; (45) 35; (46) 436; (48) 227, Minn. 332, 630; (49) 20, 631; (50) Minn. 120, 233, 637, Can. 817.
 field tests in Nova Scotia, (41) 729.
 fixed intermediates, occurrence, (44) 35.
 flour, analyses, (43) N.J. 69, Ariz. 764; (48) Can. 368.
 flour, characteristics and detection, (41) 467.
 flour, effect on yeast activity, (41) 362.
 flower and grain, development, (46) 132.
 following different crops, (44) R.I. 31; (45) N.Dak. 226.
 foot and root rot, difference in susceptibility, (47) Minn. 347.
 foot-rot disease in Northwest, (42) 351.
 for export, desirable qualities, (47) Calif. 529.
 for fattening pigs, (41) 474; (42) Wis. 373, Calif. 870; (43) 774, 870.
 for fattening steers, (43) N.Dak. 374.
 for pigs, (44) Wis. 268; Minn. 368, U.S.D.A. 771.
 for pigs, methods of preparation, (43) Okla. 70, Nebr. 673; (45) Okla. 474.
 for Volga region, composition, (50) 169.
 for young pigs, (42) Mont. 67.
 freshly harvested, germination tests, (42) 237.
 Fusarium blight, notes, (44) 243.
 Fusarium disease, (43) 751.
 genetic studies, (49) 528.
 germinating, antiscorbutic property and toxicity, (41) 471.
 germination, effect of soil acidity, (47) 722.
 grains, diastase formation, (44) 131.

Barley—Continued.

- ground—
 - analyses, (41) Conn.State 176, Can. 564; (44) 267, Wash. 471; (45) 872; (48) 68.
 - composition and retail prices, (44) Conn.State 176.
 - feeding value, (47) Minn. 374.
 - for pigs, (45) N.Dak. 270.
- growth as affected by temperature, (44) 323.
- growth in artificial light, (48) 26.
- harvesting in Argentina, (47) 32.
- hay, analyses, (48) Can. 368.
- hay, feeding value, (44) Calif. 775; (47) Calif. 673.
- hay, nutritive value, (47) Calif. 668.
- hay yields, (49) Mont. 430.
- hemipteran pest, (41) 551.
- hulls, analyses, (41) N.Y.State 868; (43) Ind. 69; (46) Mich. 168.
- hulls, digestibility as affected by sodium hydrate, (49) 167.
- hybridization, (45) 532.
- hybridization, technique, (45) 737.
- hybrids, (47) Alaska 526; (50) 24.
- hybrids, inheritance of physiological characters, (50) 228.
- improvement by selection, (46) 830.
- improvement in Ireland, (41) 335.
- Indian, germination, (47) 228.
- inheritance in, (42) 133.
- inheritance of—
 - albinism, (43) 132.
 - awns and hoods in, (49) 130.
 - leaf color, (50) 330.
 - length of internode, (44) 34.
- insects affecting, (44) 232.
- irrigation experiments, (42) Calif. 822; (46) 436; (48) Utah 437.
- irrigation water requirements, (47) Kans. 630.
- jointworm control, (42) U.S.D.A. 753.
- kernel development, effect of time of irrigation, (45) 128.
- kernels—
 - daily development, (43) 826.
 - effect of removing awns, (43) 826.
 - water content, (49) 219.
- leaf—
 - rust, life cycle, (49) Ind. 538.
 - rust, studies, (43) Ind. 345.
 - spot and streak, notes, (45) 541.
 - stripe and spot, control, (49) 840.
 - stripe, control, (43) 45; (46) 545; (49) 145.
 - stripe, studies, (50) 245.
 - stripe, tests of treatments, (49) 840.
- lime requirement tests, (44) R.I. 32.
- lime v. chalk for, (46) 716; (48) 323.
- liming experiments, (41) 826; (42) 523.
- limits of toxicity of ammonium sulphate for, (42) 219.
- lodging in, (41) 636, 733.

Barley—Continued.

- loose smut, remedies, (42) 644.
- malt, zinc content, (41) 464.
- malting, culture in Argentina, (41) 530.
- manuring experiments, (49) Can. 734.
- Mariout, (42) Calif. 32.
- meal, analyses, (42) Mich. 63.
- Mendelian characters, (44) 428.
- middlings, analyses, (41) N.Y.State 868; (42) 263, Tex. 769, Mass. 866; (45) N.Y.State 469.
- mildew, studies, (41) Mo. 654.
- mixed feed, analyses, (42) Mass. 866; (43) N.J. 69, Ky. 373; (47) 275.
- mutation, behavior in crosses of, (46) 531.
- net energy value in feeds, (50) 572.
- nomenclature among the ancients, (42) 33.
- nutrition studies, (47) Calif. 625.
- of Tripoli, characteristics, (41) 827.
- offals, feeding value, (42) 369.
- pastures, (42) Mont. 68.
- pearl, manufacture and composition, (43) 563.
- physiological characters, (42) 128.
- Piricularia on, (46) 448.
- plat tests, technique, (41) 432.
- plowing tests, N.Dak. (44) 509; (45) 226.
- plowing v. disking for, (41) Nebr. 434.
- pollen, germination of, (42) 820.
- potash for, effect on lodging, (41) 733.
- production—
 - and movement, 1850–1860, (44) 387.
 - in United States, statistical study, (49) U.S.D.A. 389.
 - in Yugoslavia, (48) U.S.D.A. 529.
 - trade, and foreign competition in, (49) 794.
- protection from birds, (45) 536.
- protein—
 - composition, factors affecting, (49) 821.
 - content, effect of time of seeding, (46) 438.
 - nutritive value, (42) 755.
- rate of manuring tests, (50) Minn. 121.
- resistance to—
 - alkali, (43) Ariz. 724.
 - Helminthosporium sativum, (48) 451.
 - nematodes, (47) 840.
- response to fertilizers, (48) R.I. 518.
- rolled, v. garbage for pigs, (44) Ariz. 571.
- root system as affected by fertilizers, (46) 132.
- roots, effect on decay of organic matter in soil, (41) N.J. 28.
- rotation experiments, (41) N.Dak. 139, 228, 229, N.Dak. 823, N.Dak. 824; (42) 132, U.S.D.A. 336, Minn. 731, Minn. 824; (44) Minn. 330, N.Dak. 524, Oreg. 827; (45) 35, N.Dak. 216,

Barley—Continued.

- rotation experiments—continued.
 - Mont. 339, N.Dak. 734, 735; (47)
 - Minn. 332; (48) Minn. 321, Minn. 332, 630.
- rust, varietal susceptibility, (45) 747.
- sand and solution culture experiments, (42) 24.
- scab organism, production of conidia, (43) 545.
- scald, resistance to, (48) Calif. 545.
- scald-resistant varieties, (47) Calif. 648.
- screenings, analyses, (41) N.H. 68.
- screenings, digestibility, (50) Mass. 168.
- seed—
 - drying, (41) 730.
 - factors affecting susceptibility to molds and fungicides, (45) 244.
 - fertilizing before planting, (48) 529.
 - infection, studies, (48) 46.
 - size as affecting yield, (41) 536.
 - standards, (47) 39.
 - treatment, (42) 644; (43) 642; (49) Wis. 643.
 - weight, relation to resulting crop, (50) 636.
- seedling—
 - depths and rates, (41) N.J. 36.
 - experiments, (41) Nebr. 36; (42) 230, Wash. 632; (44) N.Dak. 524, Oreg. 826; (45) N.Dak. 225; (47) U.S.D.A. 330, Minn. 332, Wis. 432; (48) N.Dak. 225, Minn. 331; (49) Can. 734; (50) Minn. 132.
- seedling blight, cause, (50) 648.
- smooth-awned, origin, (50) 29.
- smooth-awned, physiological value, (47) 228.
- smut—
 - control, (42) 742; (44) 747, Oreg. 841; (45) 49; (49) Okla. 542; (50) 245.
 - infection through flower, (42) 244.
 - notes, (41) 747; (43) 445.
- solution culture experiments, (41) 133.
- sources of potash for, (50) 818.
- sprouting, respiration in, (46) 224.
- standards, (47) Calif. 529.
- starch determination in, (50) 312.
- starch, microphotograph of, (48) 708.
- State standards, (44) Mont. 143.
- statistical notes, (41) 826; (42) 439.
- straw—
 - digestibility, (43) 569.
 - effect on nitrogen fixation, (43) Calif. 517.
 - hydrolyzed, composition and feeding value, (49) 166.
 - hydrolyzed, feeding value, (48) 265.
- stripe—
 - as varietal disease, (45) 49.

Barley—Continued.

- stripe—continued.
 - effect of temperature, (41) Wis. 240.
 - notes, (42) Wis. 350; (43) 346; (44) 842; (48) Can. 450.
 - resistant strains, (47) Wis. 446.
- subsoiling and packing experiments, (45) N.Dak. 212.
- supplements, (47) Idaho 776.
- tillage experiments, (45) N.Dak. 225.
- tillage methods, (48) N.Dak. 224.
- Trebi, description, (48) U.S.D.A. 228.
- use of soil potassium by, (43) 218.
- v. corn—
 - feeding value, (46) 271; (47) Mich. 175.
 - for fattening pigs, (43) Mo. 772.
 - for fattening steers, (45) Wis. 268.
 - for milch cows, (44) Wis. 271.
- v. oats for work horses, (44) Wis. 269.
- v. peas for pigs, (50) Can. 776.
- v. rye for pigs, (45) Mich. 875.
- varieties, (43) U.S.D.A. 637, Ariz. 733; (45) Wyo. 431; (46) Mich. 633; (47) Alaska 527; (49) Ga. 524.
- varieties—
 - as hay crop, (44) Calif. 731.
 - characteristics, (50) 237.
 - characteristics and yields, (47) Minn. 331.
 - classification, (46) N.Y.Cornell 831.
 - descriptions, (49) U.S.D.A. 825.
 - disease-resistant, (44) 539.
 - effect of fertilizers, (46) 729.
 - for Canada, (47) 823.
 - for seed in Poland, (50) 439.
 - German brewing, tests, (46) 831.
 - in Utah, (41) 434.
 - new, (47) Calif. 630.
 - new, description, (46) 531.
 - of Australia, (48) 437.
 - smooth-awned, (44) 634.
 - yields, (45) Wis. 132.
- variety—
 - and strain tests, plat technique, (47) Mo. 329.
 - new, characteristics, (48) 832.
 - survey key, (44) Utah 137.
 - tests, (41) Alaska 30, Alaska 31, Idaho 225, Idaho 226, Nev. 227, 229, Ariz. 331, Can. 528, 530, 535, Mich. 636, 638, Mo. 638, N.Dak. 824, Wash. 826; (42) U.S.D.A. 337, 530, Mich. 631, Wash. 631, Minn. 731, N.Dak. 732, Calif. 822, Minn. 824, Minn. 825, Minn. 826; (43) Okla. 32, N.H. 34, Wyo. 135, Nev. 228, 232, N.Dak. 332, U.S.D.A. 435, 528, Minn. 636, Can. 735, Wash. 737, Minn. 823; (44) N.Dak. 30, Alaska 327, Alaska 329, Minn. 330, Mont. 331, U.S.D.A.

Barley—Continued.

variety—continued.

tests—continued.

432, Alaska 521, Alaska 522.
Alaska 523, Ariz. 524, N.Dak.
524, Utah 525, 526, Calif. 731,
Minn. 732, Va. 732, Oreg. 826,
Oreg. 827; (45) 35, N.Dak.
225, Wis. 227, Okla. 430,
U.S.D.A. 530, 532, 631, 735,
736, Can. 822; (46) 131, 227,
Mo. 326, Mont. 327, Kans. 435,
436, Wash. 438, 531, 633; (47)
Mich. 129, Minn. 129, Minn. 130,
Nev. 131, Wyo. 131, U.S.D.A.
330, Minn. 332, Minn. 333, Pa.
429, Alaska 527, 824, Okla. 824;
(48) N.Dak. 30, 31, N.Dak.
31, Mich. 224, U.S.D.A. 224,
Can. 227, Minn. 331, Minn.
332, 434, Ariz. 434, Calif. 527,
730; (49) 31, Mont. 129, Pa.
223, Wash.Col. 224, 232, Alaska
426, Okla. 428, Tex. 429, Wyo.
429, N.Mex. 525, Idaho 732,
Ohio 733, Can. 734, U.S.D.A.
825; (50) U.S.D.A. 132, Minn.
133, Mont. 133, West.Wash.
134, Can. 432, Can. 533.

water requirements, (43) Colo. 185,
828.

wild, as hay crop, (41) Alaska 31.

wild, injury to sheep, (41) Nev. 782.

winter races from spring crosses, (46)
632.

yield cycles, (41) 892.

yields, (43) Mo. 736, 829; (44)
N.Dak. 31, Wash. 225, U.S.D.A. 228,
Alaska 327, Mont. 331; (46) Mont.
327; (47) Wash.Col. 528; (48) Mo.
628; (49) Mont. 130, Pa. 223.

yields in Australia, (43) 527; (46) 132.

yields of hay, (41) Ariz. 332.

Barn—

air, carbon dioxid content, (44) 688.
framing, braced rafter, (47) 891.
roof, Gothic, analysis of stresses, (47)
191.

roofs, self-supporting, (48) 199.

roofs, self-supporting, tests, (49) 890.

Barnacle wax-scale, notes, (45) 853.

Barns—

and shelters for cattle feeding, (47)
Iowa 891.

concrete, construction, (43) 90.

construction, (41) 488; (42) 285;
(45) Ind. 186; (47) 688.

construction, relation to sanitation,
(48) 490.

dairy, climatic, (44) 688.

dairy, construction, (45) Wis. 84, 590.

dairy, construction and equipment,
(42) Nebr. 285.

design and construction, (41) Mich.
586.

Barns—Continued.

design and construction in France,
(42) 590.

Dutch, and covered yards, designs,
(49) 287.

lighting plans, (41) 489.

plans and specifications, (45) 590.

reconstruction, (50) 388.

roof design, (42) 86.

small, plans, (49) Wash.Col. 689.

ventilation, (42) 285; (44) 200, 887;
(46) 99, 491, 587.

Barometer readings, high, in Bering Sea,
(43) U.S.D.A. 119.

Barometrical tables, revised, (41) 808.

Barrels, use for experimental silage, (45)
374.

Baryodma ontarionis, notes, (50) Pa. 454.

Bases—

formation from neutral salts in con-
tact with colloids, (41) 364.

titration of, (48) 313.

Basic slag, *see* Phosphatic slag.

Basidiomycetes—

and arboreal phanerogams, mycorrhizal
relations, (47) 541.

from Philippines, (46) 554.

Basket—

making around Oxford, (46) 788.

willows, *see* Willows.

Bassia—

hyssopifolia, notes, (47) 829.

latifolia cake, fertilizing value, (41)
816.

Bassus—

acrobasis n.sp., notes, (45) 459.

n.spp., descriptions, (41) 63.

Basswood—

utilization, (48) U.S.D.A. 141.

wood analysis, (42) 7.

Bast fibers, cellulose in, (45) 511.

Bat guano, *see* Guano.

Batao, culture directions, (45) 35.

Bathyplectes—

curculionis, notes, (45) 550.

curculionis, value, (49) Idaho 756.

exigua, parasitism by, (42) 857.

Batocera—

rubus, notes, (43) 252; (45) V.I. 150.

spp., hybrids of, (43) 456.

Batrachoda—

amydraula, notes, (47) 758.

rileyi, *see* Pyroderces rileyi.

Batrocera sp., description, (43) 57.

Bats and mosquitoes, (44) 759.

Bats, Georgian, in Wisconsin, (42) 748.

Batteries—

storage, efficiency, (50) 486.

vehicle-type, operation and care, (43)
891.

Batyl alcohol from fish liver oils, (47) 311.

Bayer 205—

action on trypanosomes and piro-
plasms, (48) 879.

for dourine control, (49) 179; (50)
81.

Bayer 205—Continued.

- for sleeping sickness, (48) 677.
- trypanocidal effect, (49) 680; (50) 184, 584.
- value, (47) 82, 486.

Beach grass and sedge as silage crop, Alaska, (41) 30; (44) 328.

Beal, F. E. L., life and writings, (42) 151.

Beams, stresses, analysis, (44) 484.

Bean—

anthracnose—

- biologic forms, Minn. (47) 347; (50) 143.
- control, (45) 50, Can. 841; (46) 844; (49) N.H. 345.
- immunity, relation to mosaic, (41) 347.
- notes, (43) 151; (44) 48; (46) N.Y.Cornell 648; (48) 242.
- resistant strains, (46) 547.
- varietal susceptibility, (41) 155; (42) 245.

aphis, *see* Aphis rumicis.

army worm, notes, (43) 52.

bacterial—

- blight, (45) Okla. 351.
- blight, elimination by aged seed, (42) 351.
- blight, systemic nature, (48) 545.
- spot, (45) Wis. 244; (47) 350; (50) 44, 446.
- wilt, notes, (44) Conn.State 149; (47) 148.

beetle, Mexican—

- distribution, (50) 848.
- distribution and life history, (48) 57.
- life history and control, (47) Colo. 56; (50) Ala. 758.
- new pest in Tennessee, (50) 849.
- notes, (44) 554, 657, Ala.Col. 751, Oreg. 850; (45) Ala.Col. 55; (48) U.S.D.A. 52, 852; (49) Ky. 549, N.Mex. 553.
- search for parasites for, (49) 761.
- summary, (45) Ala.Col. 158; (47) 555; (50) Ohio 156.

beetle, new parasitic fly from, (49) 453.

beetle, western, control, (43) Colo. 158.

blight, notes, (41) Ariz. 332, 450; (43) 153, 652; (44) 48, Oreg. 841; (46) 646; (48) 242.

bran, composition and digestibility, (43) 267.

broth for calves, (44) 776.

bug, Mauritius, notes, (43) 52.

chocolate spot disease, notes, (48) 743.

disease, description, (47) 247.

disease resistance, inheritance, (46) 546.

diseases, (41) Mich. 654, 745; (45) 649, Can. 841, 842; (47) 46; (48) Can. 144, N.J. 145.

1761—31—G

Bean—Continued.

dry root rot, (42) N.Y.Cornell 147.

dry spot, control, (47) 46.

Fusarium diseases, studies, (41) Minn. 745.

hybrid, spontaneous, analysis, (45) 427.

ladybird, control, summary, (42) U.S.D.A. 252.

ladybird, studies, (43) U.S.D.A. 455.

leaf beetle, control, (49) N.C. 757.

leaf beetle, notes, (41) Conn.State 159; (47) N.Y.Cornell 848; (48) 741.

leafhopper—

and hopperburn, control, (47) Fla. 758.

biology and control, (48) 53.

notes, (45) V.I. 150.

louse, *see* Aphis rumicis.

meal, cull, analyses, (42) Mich. 63.

meal, Japanese, analyses, (42) Tex. 769.

meal, navy, nutritive value, (42) 756.

mildew on Limas, (50) N.Y.State 546.

mosaic—

notes, (44) Oreg. 841; (45) 541; (48) 243.

organism associated with, (48) Mich. 644.

protozoa with, (49) Mich. 45.

relation to anthracnose immunity, (41) 347.

studies, (45) Can. 842.

transmission, (45) Mich. 242.

varietal susceptibility to, (41) 155; (42) 245.

virus, transference, (48) 45.

virus, transmission and thermal death point, (43) 751.

pod blight on Limas, (45) N.C. 443.

pod canker, notes, (41) 154.

pod disease, notes, (43) 152.

rust—

fungus, biologic forms, (45) 446.

notes, (43) 45; (46) 741; (47) 839; (48) 842.

resistance, (44) Calif. 744.

resistant varieties, (44) Va. 746.

varietal susceptibility, (45) 445; (49) 441.

seed—

disinfection tests, (49) 841.

home-grown, value, (49) Mont. 136.

iron and manganese content, (49) 202.

sprouted, vitamin content, (48) 826.

seedlings—

growth in wind, (46) 827.

translocation of mineral constituents, (45) 125.

variant, vascular anatomy, (46) 27.

vascular anatomy, (46) 825, 826.

Bean—Continued.

- spotting disease, notes, (42) 351; (45) 846.
 - starch, microphotograph of, (48) 708.
 - stem blight, new, notes, (50) S.C. 648.
 - stem weevil, studies, (44) 660.
 - straw, effect on nitrogen fixation, (48) Calif. 517.
 - straw mulching, value for citrus, (49) 835
 - streak disease, notes, (48) 743.
 - thrips, notes, (48) Fla. 251.
 - weevil, 4-spotted, biology, (50) 850.
 - weevil, 4-spotted, parasite of, (49) 256.
 - weevil—
 - in South Dakota, (43) 850.
 - life history, (42) U.S.D.A. 548.
 - life history and control, (42) Okla. 856.
 - Mexican, notes, (45) 853.
 - rate of metabolism, effect of atmospheric moisture, (48) N.J. 353.
 - response to atmospheric moisture, (46) 661.
 - summary, (48) U.S.D.A. 359.
 - treatment, (49) Mich. 898.
 - weevils—
 - as affected by humidity, (41) N.J. 58.
 - control, (41) 759; (47) Ohio 358, 555.
 - notes, (41) N.C. 660; (47) N.Y. Cornell 848.
 - popular account, (41) U.S.D.A. 667.
 - wilt, effect of moisture, (49) 751.
- Beans—
- absorption of hydrocyanic acid by, (49) U.S.D.A. 457.
 - acreage and time of planting, (41) P.R. 433.
 - adzuki, anthracnose immunity, (41) 347.
 - adzuki, unifoliate mutation in, (42) 224.
 - aerial fertilization with carbon dioxide, (41) Vt. 833.
 - analyses, (43) 63.
 - as affected by—
 - borax, (44) Me. 129; (45) 426; (46) 123, Conn.State 322; (47) N.H. 423.
 - carbon dioxide, (45) 834.
 - pepto-humic fertilizer, (44) 420.
 - potash, (49) 817.
 - soil temperature, (45) 336.
 - sulphur, (50) Oreg. 724.
 - as green manure, (44) V.I. 332, 827.
 - Bacillus botulinus* on, (44) 763.
 - Bacterium solanacearum* on, (42) 351.
 - blackeye, use in citrus groves, (42) Calif. 831.
 - Brazilian, as feed for livestock in Germany, (48) 369.
 - Brazilian, new edible, (44) 460.

Beans—Continued.

- breeding experiments, (41) N.J. 43; (42) Minn. 834; (43) Ariz. 734; (44) P.R. 236, P.R. 433, Ariz. 524, Minn. 739; (46) 633; (48) Mich. 224; (49) Can. 734.
- broad, seed coats, feeding value, (42) 369.
- Burma, as human food, (41) 168.
- Burma, prussic acid in, (41) 633.
- bush and pole, studies, (49) 841.
- canned, anaerobic thermophile from, (50) Mich. 459.
- canned, bacterial flora, (46) 859.
- canning studies, (46) U.S.D.A. 664.
- canning, temperature changes in, (45) U.S.D.A. 560.
- carob, alcohol production from, (46) 509.
- cost of production, (44) U.S.D.A. 789; (46) 389, Miss. 590; (47) Idaho 593; (48) N.Y. Cornell 787.
- cull, feeding value, (50) Mich. 474.
- cull pinto, feeding value, (43) N.Mex. 377.
- culture, (44) Hawaii 29, 827; (47) N.Mex. 333; (48) Minn. 338; (49) Mont. 136.
- culture—
 - experiments, (41) 333, Nebr. 638, 729, 825; (42) Tex. 828; (44) Utah 525, 733; (45) Kans. 33; (46) 436; (48) V.I. 340, Can. 450; (49) Can. 734; (50) Can. 231.
 - in Burma, (41) 529; (42) 436.
 - in Montserrat, (41) 825.
 - in Scotland, (41) 640.
- description and agricultural value, (43) 528.
- distribution of chemical components, (42) 229.
- dusting experiments, (45) 345, 552.
- early growth in alkali soil, (42) Utah 28.
- effect of—
 - maturity of plant on pods and seeds, (41) N.J. 43.
 - position in pod, (41) N.J. 43.
 - soil disinfection, (42) 717.
 - soil electrification, (43) Ky. 824.
 - spacing, (45) 828.
- effect on following crop, (44) R.I. 31.
- effect on water extract of soil, (44) 719.
- enzym content, (42) 228.
- fertilizer experiments, (41) 529, 627; (42) 222, 223, 719; (44) Hawaii 30, 733; (49) N.H. 336.
- for 1923, (49) Mich. 97.
- foreign, botanical determination, (50) 23.
- French, varieties at Wisley, (44) 40.
- frost injury, (41) 335.
- garden, rate of planting, (49) 137.

Beans—Continued.

- garden, variety tests and melon fly injury, (41) Hawaii 146.
- germinated, antiscorbutic value, (41) 861.
- germinated, digestibility, (44) 761.
- Gloeosporium lindemuthianum* attacking, (43) 546.
- ground, use as grasshopper bait, (43) 353.
- growth in artificial light, (41) 885; (48) 26.
- growth in relation to humidity and temperature, (47) 831.
- heat injury in Colorado, (46) 145.
- horse, *see* Horse beans.
- hyacinth, specific names, (41) 523.
- hybrid, anthracnose and mosaic resistant, (50) 650.
- hybridization experiments, (46) 430.
- hydrocyanic acid content, (43) 610.
- improved Robust, (49) Mich. 32.
- in the pod, insects affecting, (44) 549.
- inheritance in, (43) 818; (45) 427; (47) 524; (49) 822.
- inheritance of disease resistance, (45) 542.
- inoculation, (45) Colo. 213; (48) Wash.Col. 832.
- insects affecting, (47) N.Y.Cornell 848.
- irrigation experiments, (42) 576.
- jack, *see* Jack beans.
- kidney, breeding experiments, (48) P.R. 227.
- Lima—
 - acclimatization in Straits Settlements, (41) 738.
 - bacterial spot, (45) Wis. 244; (47) 350; (50) 44, 446.
 - cost of production, (48) N.Y.Cornell, 787.
 - effect of borax, (49) U.S.D.A. 324.
 - effect of inoculation, (47) Ill. 830.
 - effect of position in pod, (42) 138.
 - maggot affecting, (41) N.J. 58.
 - pod blight, (45) N.C. 443.
 - proteins of, (48) 107.
 - seed inoculation, (45) Ill. 44
 - varieties, (44) P.R. 442.
 - variety tests, (43) U.S.D.A. 134.
 - yeast parasitic on, (50) 650.
- liming experiments, (45) 624.
- longevity of seed, (46) 537.
- losses in transit and storage, (45) 849.
- manuring experiments, (46) N.H. 318; (50) 29.
- marutong, culture directions, (45) 35.
- Mendelian characters, (44) 428.
- Moki Lima, characteristics and analyses, (47) 825.
- moth, culture experiments, (41) Tex. 36.
- mulching experiments, (49) Ohio 337.
- mungo, *see* Mungo beans.
- natural inoculation, (45) Colo. 213.
- navy, *see* Navy beans.

Beans—Continued.

- new strain, (42) N.J. 835.
- nickel and cobalt in, (49) 520.
- notes, (48) Hawaii 330.
- observations and experiments, (50) N.Y.State 546.
- Olneya, utilization, (41) 834.
- oriental, analyses, (44) Calif. 731.
- patani, culture directions, (45) 35.
- patani, notes, (46) Guam 726.
- phosphorus requirements, (44) R.I. 32.
- physiological isolation, (42) 435.
- pinto, digestibility and productive value, (47) Tex. 472.
- pinto, yields, (43) Nev. 229.
- planted with corn, test, (47) Miss. 428.
- pole, in drills with corn, varieties, (49) R.I. 526.
- production in Brazil, (43) 292.
- production in Cuba, (42) 31.
- proteins, nutritive value, (46) 564.
- proteins of, (47) 407.
- rangoon, disease, notes, (44) 445, 446.
- rangoon, fungus affecting, (45) 48.
- rice, as green mulch for bananas, (43) 532.
- Robust, characteristics, (46) Mich. 132.
- root development, (43) 834.
- seed corn maggot injury, (41) 259.
- seed treatment, (41) 754.
- seed value, (50) 636.
- seeding depths, (41) N.J. 42.
- seguidilla, culture directions, (45) 35.
- selection, mass and individual, (46) 734.
- sitao, culture directions, (45) 35.
- Sitones lineatus* on, (45) 363.
- small-seeded horse, characteristics and uses, (49) Calif. 228.
- snap, effect of borax, (49) U.S.D.A. 324.
- spoiled, thermophilic organism in, (44) 62.
- staking, (43) 339.
- strain selections, (50) Minn. 139.
- string, variety tests, (43) U.S.D.A. 437.
- susceptibility to *Uromyces appendiculatus*, (45) 50.
- sword, analyses, (41) Ariz. 367.
- tepary, *see* Tepary beans.
- Tornillo, feeding value, (43) N.Mex. 377.
- variation, correlation, and death rate, (41) 327.
- varieties, (44) Ohio 740; (45) P.R. 631; (46) Mich. 633; (50) Mont. 139.
- varieties—
 - behavior, (48) Guam 228.
 - for Canada, (47) 823.
 - for dry farming, (41) Ariz. 29.
 - for forage, (41) Tex. 36.
 - tolerant to alkali, (42) Calif. 823.
- variety resistant to drought, (41) Nebr. 434.

Beans—Continued.

- variety tests, (41) 443, 529, 825; (42) Minn. 835; (43) Tex. 36, 528, Minn. 636; (44) R.I. 31, P.R. 235, Minn. 330, Mont. 337, P.R. 442, Minn. 732, 733, 827; (45) 340, Nebr. 531, Can. 822; (46) Mont. 327, Hawaii 633, Guam 726; (47) Minn. 129, Minn. 130, 824, Miss. 831; (48) P.R. 234, Minn. 331, Minn. 332, 629; (49) Guam 426, Tex. 429, Can. 734; (50) 28.
- vascular apparatus in, (47) 127.
- velvet, *see* Velvet beans.
- viability as affected by heat, (41) 430.
- viability, effect of loss of water, (48) N.J. 353.
- yield and costs, (47) Mich. 697.
- Bear grass, feeding value, Tex. (41) 70; (42) 369.
- Beaver farming, (49) 250.
- Beavers—
 - habits, control, and use, (48) U.S.D.A. 250.
 - in the Adirondacks, studies, (48) 150.
 - new subspecies, (42) 748.
- Beckmannia cruceaformis, analyses, (41) Wyo. 333.
- Bedbug—
 - bionomics of, (50) 356.
 - human parasite in stomach of, (47) 182.
 - paper on, (47) Mich. 196.
 - parasite of, (45) 161.
 - tropical, life history, (50) 556.
 - trypanosoma in, (48) 879.
- Bedbugs—
 - control, paper on, (42) 152.
 - eradication by steam, (42) 358.
 - life history studies, (42) 358.
 - tropical, relation to relapsing fever, (50) 53.
 - tularaemia transmission by, (46) 662.
- Bee farm, modern, economic management, (43) 57.
- Bee moth—
 - caterpillar, immunity in, (47) 853.
 - control, paper on, (42) 152.
 - epizootic among, (48) 54.
 - studies, (48) 155.
- Beech—
 - leaves and twigs, feeding value, (45) 774.
 - nuts, germination, (49) 536.
 - oak mildew on, in British Isles, (42) 747.
 - red, reproduction and growth, (41) 744.
 - seedlings, growth as affected by organic substances, (43) 822.
 - southern, forests of New Zealand, (46) 542.
 - winter injury or leaf scorch, (41) 752.
 - woods, British, ecology, (49) 536.
- Beeches, inheritance of leafing time, (41) 331.

Beechnut—

- cake, feeding value, (42) 369.
- germs, feeding value, (42) 369.
- meal, digestion trial, (45) 774.
- Beef—*see also* Cattle, beef.
 - agar, clear, preparation, (48) 10.
 - and beef products, gastric response to, (41) 857.
 - antiscorbutic value, (41) 861.
 - autolysis, (49) 11.
 - blood, alkalinity determination, (42) 614.
 - blood, sodium content, (45) 112.
 - bone fat, composition, (48) 310.
 - cattle business, relation to farm organization, (50) 199.
 - cause of souring, (45) 764.
 - cold storage holdings, (49) U.S.D.A. 893.
 - cold storage, treatment, (44) 61.
 - composition, (48) Mo. 663.
 - cost and price indexes, (43) Mo. 792.
 - cost of production, (46) Iowa 366; (48) Mo. 686; (49) Ind. 592.
 - cracklings, analyses, (45) N.Y. State 469.
 - curing and preservation, (45) 260.
 - dressing and cutting on the farm, (46) Iowa 477.
 - effect on blood regeneration, (44) 565.
 - exports of New Zealand, (42) 867.
 - extract medium, preparation, (41) 781.
 - extracts, studies, (41) 113.
 - fat v. lean, cooking tests, (42) 868.
 - fifth quarter, value, (47) 571.
 - frozen, British trade in, (47) 275.
 - globulin-albumin fraction, amino acids in, (48) 803.
 - imports, British, statistics, (42) 867.
 - in Union of South Africa, improving, (50) 367.
 - intensive production, (47) 374.
 - international trade, (46) 675.
 - muscle, creatin content, (49) 613.
 - prices, (43) U.S.D.A. 595.
 - production, (42) Nebr. 168; (48) U.S.D.A. 290.
 - production—
 - and international trade, (41) U.S.D.A. 892.
 - feeds for, (47) 278.
 - future, in England, (42) 868.
 - in Colorado, (48) 474.
 - in Corn Belt, (46) U.S.D.A. 269.
 - in Cotton Belt, (50) U.S.D.A. 573.
 - in Madagascar, (44) 267.
 - sunflower silage v. corn silage for, (49) Wash. Col. 268.
- raw, vitamins in, (43) 664.
- retail prices in North Dakota, (42) N.Dak. 363.
- scrap, analysis, (41) Can. 565, N.Y. State 868; (46) Can. 168.
- scrap, feeding value, (48) Mo. 666.
- scrap, tankage as substitute, (49) Can. 70.

Beef—Continued.

- scrap v. skim milk for egg production, (50) Can. 472.
- scrap, value for egg production, (50) 273.
- serum, alkalinity determination, (42) 614.
- serum, normal, effect on anthrax bacillus, (42) 475.
- serum, use against anthrax, (46) 579.
- testing for tubercular infection, (41) 191.
- trade, British import, (44) 866; (49) 296.
- trade in Union of South Africa, (43) 673.

Beehives—

- double-walled, value, (47) U.S.D.A. 558.
- planning and construction, (47) 391.
- weight variations, recording apparatus for, (43) Okla. 58.

Beehole borer of teak, (47) 856.

Beekeepers' Association of Ontario, report, (42) 160; (47) 259; (48) 856; (50) 57.

Beekeeping, (44) S.C. 555; (45) Okla. 453.

Beekeeping—

- accounting records, (47) Mich. 697.
- collected leaflets on, (48) 653.
- division of, (44) Minn. 760.
- education in, (49) 251.
- elements of, (41) 63, 463.
- experiments, (43) 662.
- extension, (42) Calif. 848.
- for beginners, (49) 255.
- for Oregon farmer, (43) 457.
- guide, (44) 356.
- handbook, (46) 254; (47) 259; (48) 59; (49) 660.
- in Arizona, (45) 762.
- in buckwheat region, (47) U.S.D.A. 57.
- in California, (45) 461.
- in Canada, Can. (46) 254; (49) 855; (50) 158.
- in clover region, (47) U.S.D.A. 57.
- in coffee plantations, (50) 663.
- in Colorado, (50) 158.
- in France, (50) 158.
- in Illinois, (41) 463.
- in India, (45) 657.
- in Iowa, (45) 762.
- in New Hampshire, (46) 159.
- in Oklahoma, (42) 160.
- in Ontario, (42) 160.
- in Oregon, (49) 762.
- in Quebec, (41) 63.
- in South Africa, (45) 559.
- in Switzerland, business organization and returns, (47) 294.
- in the South, (46) 160.
- in time of Aristotle, (46) 463.
- in tropical colonies, (49) 762.
- in tulip tree region, (47) U.S.D.A. 57.
- in Virginia, (45) 762.
- index to literature, (44) 856.
- industry, (42) 647.
- instruction in, (47) 659; (49) 96.

Beekeeping—Continued.

- notes, (47) Can. 362, Minn. 362, Wis. 452; (48) P.R. 252, 856.
- on the farm, (42) 51.
- papers on, (41) 359; (42) 152; (45) 159; (46) 58; (47) 259, 557.
- popular account, (46) 463.
- principles, treatise, (46) 463.
- research work by Texas Station, (49) 357.
- studies, (41) Iowa 261, Can. 556; (50) Minn. 157.
- summary, (43) Tex. 258, 259, Ark. 763; (49) 762; (50) 561.
- to conserve sugar, (42) 252.
- treatise, (43) 57, 661; (45) 461; (48) 255; (49) 762.

Beer—

- analysis, official method, (44) 9.
- antiscorbutic value, (41) 861.
- substitutes, (41) 66.

Bees—

- ability of queen and drone to feed themselves, (48) 753.
- affected by European foulbrood, behavior, (42) U.S.D.A. 859.
- alimentary canal and ferments, (48) 359.
- anatomy, handbook, (50) 762.
- and honey, scoring exhibits in, (50) 195.
- as affected by sprays, (43) Ind. 351, 662, Ind. 856; (49) Wash.Col. 251.
- auditory sense of, (45) 461.
- beginning with, (49) West.Wash. 97.
- behavior in fall, (44) Wash. 60.
- body temperatures, (49) 659.
- breeding experiments, (44) 856; (45) Can. 859; (49) Can. 855.
- brood diseases, (42) 362.
- brood diseases, mixed infection in, (45) 159.
- chalcid parasite of, (48) 556.
- competitive egg-laying test, (49) Okla. 450.
- determination of age in, (42) 860.
- development of sexes, (41) 846.
- disappearing disease, studies, (44) Calif. 752.
- disease act in Florida, (46) 457.
- disease control, (46) 752.
- disease law of Georgia, (45) 860.
- diseases, (41) 463; (45) Wis. 252, Mich. 860; (50) Minn. 156, U.S.D.A. 158.
- diseases and treatment, (50) 153, 582, 663.
- diseases in Ontario, (47) 856.
- effect on fertilization and bearing in fruit trees, (47) 128.
- Egyptian, notes, (49) 660.
- fall feeding, (44) 356.
- fertilization in, (43) 857.
- flight studies, (48) 653.
- for the horticulturist, (48) 556.
- foulbrood, *see* Foulbrood.
- habits and activities, (50) 458.

Bees—Continued.

- handbook for beginners, (42) 56.
- heat production in winter, (46) U.S.D.A. 254.
- honey production, (48) Ariz. 457.
- honey-gathering abilities, (46) 196.
- infected with *Nosema apis*, (44) 856.
- inheritance in, (49) 453.
- intestines, epithelial cells of, (45) 655.
- language of, (48) 857.
- length of life, relation to work, (48) 653.
- life history, (42) 51; (48) 359.
- management, (43) Wash. 496.
- normal bacterial flora of, (45) 559.
- North American, distribution, (45) 762.
- Nosema* affected stocks, (43) 59.
- Nosema apis* in, diagnosis, (41) 667.
- Nosema* disease, U.S.D.A. (41) 359; (46) 858.
- notes, (45) 359.
- number and length of daily trips, (46) Iowa 349.
- of Australia, catalogue, (50) 359.
- olfactory sense of, (45) 461.
- on clover, effect of corolla tube length, (45) 826.
- outdoor wintering, (49) 659.
- paralysis, control, (43) Okla. 51.
- paratyphoid of, (47) 259, 260.
- photic reactions of, (42) 160.
- pupal cell, (46) 51.
- queen—
 - breeding and rearing, (50) Minn. 157.
 - controlled fertilization, (45) 159.
 - keeping two in a hive, (41) 556.
 - mating, (42) 549; (44) 856.
 - oviposition, graphic representation, (49) 558.
 - rearing, (44) 167; (47) Minn. 362; (50) 158.
- role in pollination, (46) 840.
- sex in, (48) 567.
- stimulative feeding, (43) 662.
- studies, (49) Iowa 757.
- swarm control, (45) U.S.D.A. 559; (49) Can. 855.
- swarming, relation to phototropism, (43) 851.
- temperature, (43) 51; (50) Minn. 152.
- toxicity of arsenic to, (49) U.S.D.A. 449.
- transferring, (43) 563.
- treatise, (41) 463; (47) 58, 362; (50) 359.
- two-year brood curve for colony, (49) 357.
- v. spraying, (50) 663.
- value in fruit production, (50) 561.
- value of Hubam clover to, (47) Ohio 137, Okla. 856.
- ventriculus, histology, (50) Minn. 156, 561.
- weight and source of nectar, (44) Iowa 452.

Bees—Continued.

- winter loss, (42) 362.
- winter protection, (43) 163; (45) Okla. 61, 159, 461.
- winter protection, value, (49) 357.
- winter stores for, (43) Can. 762.
- wintering, (41) 759; (44) Can. 258, Kans. 258; (47) Wis. 57; (49) Wis. 653.
- working habits, (47) Iowa 756.
- Beeswax—
 - extraction of, (46) 114.
 - Indian, analyses, (47) 803.
 - production in the Sudan, (45) 663.
- Beet—
 - aphid, identity of, (41) 255.
 - blight, studies, (44) Calif. 744.
 - by-products, feeding value, (45) Colo. 269; (48) 398; (49) 870.
 - curly leaf, causative agent, (46) 658; (48) 453.
 - diseases, (41) 745; (44) 642.
 - eel-worm, notes, (43) 243.
 - extract as an indicator, (41) 112.
 - fields, child labor and work of mothers in, (49) 795.
 - leaf beetle, studies, U.S.D.A., (44) 256; (45) 157.
 - leaf blight, notes, (44) 48.
 - leaf spot, notes, (48) 741.
 - leafhopper—
 - as carrier of curly top, (50) 660.
 - breeding area, (42) Calif. 848; (48) 750.
 - control, (46) 854; (47) 255, Calif. 653; (48) Calif. 550.
 - in California, studies, (50) 660.
 - incubation periods of causative agent of curly leaf, (48) 453.
 - life history, (44) 654, Calif. 752; (46) 854.
 - migration of, (48) 750.
 - notes, (41) N.Mex. 159, 456, 755.
 - relation to curly leaf, (46) 658.
 - use of systematic observations on, (48) 651.
 - leaves and spinach, differentiation, (46) 311.
 - leaves, carbohydrates, effect of desiccation methods, (49) 10.
 - molasses—
 - desaccharification, (41) 314; (46) 616.
 - effects on weanling pigs, (43) 180.
 - nematode root gall, notes, (45) 842.
 - nematodes, control, (47) 544; (49) 842.
 - nematodes, factors affecting sex ratio in, (48) 245.
 - pulp, dried—
 - analyses, (41) N.H. 68, Conn. State 176, Ind. 564, R.I. 564, Can. 565, N.Y.State 868; (42) Mich. 63, 263, N.H. 769, Tex. 769, Mass. 866; (43) N.J. 69,

Beet—Continued.

pulp, dried—continued.

analyses—continued.

Ky. 373, Vt. 464, N.J. 672, 867,
Ind. 867; (44) 267, Mass. 671,
N.H. 671; (45) Tex. 68, N.Y.
State 469, N.J. 775, 872, R.I.
872; (46) Mich. 168, N.H. 675,
Tex. 675, 871; (47) N.Y. State
172, Mass. 274, 275, Conn. State
570, N.J. 571; (48) 68, Me. 68.
composition and retail prices,
Conn. State, (44) 176; (45)
375; (47) 570.

energy value, (47) 69.

feeding value, (42) Tex. 369.

v. mangels for cows, (50) Can.
375.pulp, extracted, dry distillation of,
(45) 209.

pulp, extracted, saponin in, (45) 204.

pulp, feeding value, (42) Calif. 868;
(45) Colo. 270; (49) Nebr. 671.pulp press water, purification, (45)
616.

root scab, control, (42) 147.

root tumor, notes, (44) 643.

roots, insulin in, (50) 767.

roots, nematodes in, (44) 49.

seed—

Coprinus sp. on, (45) 48.

disinfection, (49) 842.

germination, (50) 740.

industry, American, (44) 143.

sale in France, (46) 637.

testing and valuation, (50) 238.

treatment, (42) 147; (45) 28.

sirup, manufacture and use, (44) 507.

straw, digestibility, (43) 569.

sugar—

industry in Victoria, (43) 532.

manufacture, process control,
(45) 109.

manufacture, progress, (45) 509.

manufacture, technology, (46)
417.

manufacture, treatise, (45) 807.

plant, waste disposal, (43) 479.

products, moisture in, (44) 614.

sirup, examination, (44) 507.

top silage, feeding value, (42) U.S.D.A.
370.

tops, feeding value, (49) Nebr. 671.

tumors, studies, (49) 820.

vinasse, feeding value, (46) 67.

webworm—

control, (46) 153.

life history and habits, (49) 253;
(50) 336.notes, (41) Mont. 57; (42) 545;
(43) Colo. 158; (45) Mont.
359, 550.

southern, notes, (45) V.I. 150.

webworms in Alberta, (47) 756.

Beetle—

-Asiatic, in Connecticut, (50) Conn. State
50.

Beetle—Continued.

cloaked knotty-horn, biology, (50) 661.

East Indian rhinoceros, notes, (49)
50.larvae feeding on microscopic slides,
(48) 158.

new, injurious to oil palm, (44) 854.

Beetles—

Ambrosia, control, (48) 53.

attacking hazelnut scale, (43) 252.

British, handbook, (41) 455.

buprestid, of Mexico, studies, (48)
856.

dermestid, parasite of, (42) 751.

elaterid, genotypes, (45) 661.

furniture, life history and control, (44)
658.

green Japanese, notes, (43) 362.

grayback, nomenclature, (45) 761.

ground, in Mysore, (41) 165.

hardback, on sugar cane, (42) 52.

host selection principle, (46) 353;
(49) 448.

Japanese, see Japanese beetle.

leaf-eating, affecting cotton, (49) 758.

new cerambycid, (46) 461, 661.

new hymenopterous parasite of, (47)
260.

new myrmecophilous, (46) 159.

North American, larvae of, (43) 854.

North American predacious, in U.S. Na-
tional Museum, (47) 658.

of Central Europe, (46) 51.

of Europe, treatise, (42) 854.

powder-post, damage to timber, (45)
891.

powder-post, parasite of, (43) 456.

prionine, notes (42) 454.

snout, life history, (47) U.S.D.A. 556.

treatise, (42) 455; (50) 359.

wood-boring on black locust, (43) 854.

Beets—

analyses, (43) 63.

anthocyanin in, (43) 132.

antiscorbutic value, (41) 861.

as affected by—

carbon dioxid, (42) 816.

deep cultivation, (44) 812.

pepto-hamic fertilizer, (44) 420.

potash, (45) 521.

potash and kainit, (44) 515.

sodium chlorid, (41) 126.

urea superphosphate, (45) 330.

as oats substitutes for horses, (50)
575.

Bacillus botulinus on, (44) 763.

breeding experiments, (44) 632.

canned, botulism from, (43) 865.

composition as affected by soils and
fertilizers, (41) 422.

cost of production in France, (50) 191.

criteria of ripeness, (42) 130.

culture experiments, (43) 638; (44)
632; (48) V.I. 340; (49) Alaska
435.culture on peat soil, (45) 735; (46)
216.

Beets—Continued.

- effect on following crop, (44) R.I. 31, R.I. 33; (46) 336; (49) Mont. 129.
- fertilizer experiments, (41) Mass. 21, 627, 733; (42) 223, 330, 719; (43) 427; (44) R.I. 21, 128, 217, 317; (47) R.I. 725; (48) 721; (49) 20.
- field, *see* Mangels.
- for 1923, (49) Mich. 97.
- formation of red pigment in, (50) 224.
- green manuring experiments, (44) 317.
- iodin content, (43) 204, 632.
- irrigation experiments, (42) 138, 576; (46) Mich. 537.
- lime requirements, (46) R.I. 233.
- lining experiments, (41) Mass. 21, 428; (42) 523.
- lithium in, (46) Colo. 29.
- manganese in, (46) Colo. 29.
- manuring experiments, (43) 24; (50) R.I. 35.
- Mendelian characters, (44) 428.
- mother, time for testing, (50) 536.
- net energy value in feeds, (50) 572.
- new pest in Italy, (41) 460.
- nutritive value, (41) 557; (47) Calif. 668.
- phosphorus requirements, (44) R.I. 31.
- relative cost before and after war in France, (42) 593.
- seed production, (41) 733; (45) 740.
- sliced, energy value, (47) 69.
- sodium for, (41) R.I. 426.
- strain test, (41) N.J. 41.
- sugar, *see* Sugar beets.
- varieties, (44) N.J. 337.
- variety tests, (41) 237; (42) Minn. 835; (43) 528, 638; (44) 632; (46) Mont. 327; (47) 824, Miss. 831; (48) Ariz. 442.
- vitamin content, (41) 762; (42) 759.
- wild, composition, (47) 37.
- yields, relation to size of seed, (45) 829.

Beggar weed as forage crop, (41) Tex. 36.

Begonia—

- diseases, (48) Can. 144.
- double flowers and linkage in, (43) 632.
- Begonias, protection from frost, (44) 811.
- Belascaris marginata, notes, (43) U.S.D.A. 276; (49) 684.

Belladonna—

- alkaloids in, biology, (50) 223.
- culture, effect of sunlight, (50) 223.

Belle Fourche project farm in 1918, (42) U.S.D.A. 396.

Belt—

- conveyors and elevators, treatise, (50) 189.
- drives, geometry of, (43) 891.
- horsepower, determination, (44) 189.
- lacing, proper, data, (44) 287.
- pulleys, repair, (44) 887.
- speeds, studies, (47) 688.

Belting—

- care and use on the farm, (44) 189.
- leather, specifications, (49) 590.

Belting—Continued.

- oak leather, tests of flesh and grain sides, (49) 486.

Belts—

- data charts on transmission of horsepower, (43) 483.
- for power transmission, tests, (43) 285.
- wire, tests, (43) 891.

Bembecla hylaeiformis, studies, (41) 667.

Bembex lunata, notes, (45) 658.

Bench marks in Texas, (41) 583.

Bensonberry, culture, (47) Alaska 534.

Benzaldehyde—

- effect on protein hydrolysis, (43) 110.
- nitrobenzol in, detecting, (47) 611.

Benzidln—

- in test for phosphoric acid, (49) 407.
- sulphate, solubility in water, (43) 504.

Benzoate renal function test, application to cattle, (50) Minn. 181.

Benzoic acid—

- adsorption of insulin on, (50) 611.
- effect on molds, (45) 463.
- in fruit juices, (49) 805.
- in margarin, determination, (47) 806.
- purification, (42) 611.

Benzol—

- as motor fuel, (50) 387.
- larvicidal value, (49) 356.
- v. gasoline as engine fuel, (48) 785.

Benzoquinhydrone electrode, application to electrometric titrations, (50) 507.

Benzyl alcohol—

- effect on toxins and tuberculin, (45) 481, 482.
- in experimental tuberculosis, (43) 584.

Bephrrata cubensis, biology, (50) 57.

Berberis spp., identification, (46) 721.

Beriberi—

- among British troops, (43) 262, 263.
- among Chinese in France, (45) 467.
- among Filipinos, (42) 462.
- among troops in Mesopotamia, (42) 463; (45) 868.
- and pellagra, leucocyte changes in, (45) 66.
- and Vitamin B, (47) 168.
- avian, glyoxalase in, (45) 868.
- avian, studies, (45) 768.
- basal metabolism in, (50) 63.
- carbohydrate metabolism in, (42) 557.
- etiology, studies, (48) 564.
- genesis of edema in, (45) 568.
- human, and polished rice disease, (50) 668.
- in Japan, cause and treatment, (50) 865.
- in rats, lesions in bones, (47) 65.
- in rats, symptoms and anatomical changes, (47) 769.
- in the garrison at Porto Rico, (48) 262.
- nervous lesion in, (46) 360, 669.
- notes, (41) 764; (44) 361.
- occurrence and etiology in China, (47) 169.
- on Norwegian ships, cause, (44) 862.

Beriberi—Continued.

- pigeon, and vitamin B, (47) 862.
- prevention, rôle of vitamins in, (45) 867.
- relation to polished rice consumption, (42) 457.
- review of literature, (46) 257, 869.
- studies, (41) 265; (43) 462.
- treatment, tikitiki extract for, (46) 569.
- water content of tissues in, (47) 369.
- Beriberi-like disease in mammals, (46) 668; (47) 268.
- Bermuda grass—
 - breeding experiments, (45) Okla. 431.
 - pasture, culture, (45) Miss. 126.
- Berries, *see* Fruit, small, and Raspberry, Strawberry, *etc.*
- Berry containers, standard size, (44) 144.
- Berseem—
 - adaptation and behavior, (48) Calif. 527.
 - analyses and digestibility, (44) 567.
 - as forage crop, (44) 527.
 - breeding in Egypt, notes, (44) 500.
 - culture and use in Australia, (47) 227.
 - culture experiments, (44) 527.
 - yields in Australia, (43) 527; (46) 132.
- Betabacterium new genus, erection, (43) 680.
- Betacoccus new genus, erection, (43) 680.
- Betain—
 - cleavage by bacteria of "guanol," (43) 27.
 - migration in plants, (42) 335.
- Betanaphthol, anthelmintic value, (50) 380.
- Betel—
 - palm, culture, (42) 444.
 - vine, culture, (42) 444.
 - vine leaves, disease affecting, (49) 839.
- Beverage samples, fermentable, preservatives for, (43) 804.
- Beverages—
 - alcoholic, in war time, (42) 552.
 - analyses, (43) Conn.State 859; (47) Calif. 660, Me. 764.
 - and their adulteration, (41) 467.
 - bottled, (41) U.S.D.A. 669.
 - bottled, ingredients, (47) 611.
 - carbon dioxid content, (50) 804.
 - carbonated, preparation of fruit juices for, (47) Calif. 613.
 - carbonated, viability of colon-typhoid group in, (46) 754.
 - fruit, manufacture, (49) Calif. 412.
 - imitation fruit juice, (46) 113.
 - industry in France, (43) 261.
 - inspection, (47) Conn.State 559.
 - inspection and analysis, (45) Conn. State 365.
 - methods of investigation and standards, (41) 558.
 - substitutes in Germany, (43) 204.
- Bay beans, oil from, analyses, (47) 803.

- Bezssonoff reagent for vitamin C, preparation, (49) 805.
- Biblio—
 - hortulanus, biology, (45) 655.
 - marci, parasite of, (47) 554.
- Bibliography of—
 - abortion, (41) 192; (49) 785.
 - abortion—
 - and associated diseases, (49) Calif. 79.
 - in mares, (49) 283.
 - rôle of udder in, (48) 380.
 - acacias, Australian, (41) 744.
 - acacias, tropical, of Queensland, (42) 840.
 - Acanthocephala, fresh-water, (41) 464.
 - Acer, reproduction in, (47) 126.
 - acid soils, (49) 512.
 - acidosis, (41) 281.
 - aculeata, parasitic, (42) 159.
 - agricultural books for high schools, (43) 698.
 - agriculture—
 - evolution of, (45) 491.
 - French books on, (42) 599.
 - in America, beginnings, (49) 191.
 - in New Zealand, (46) 789.
 - in Virginia, (42) 490.
 - Agrilus spp., (44) 164.
 - agro-geology, (47) 211.
 - Agrotis segetum, (50) 255.
 - alfalfa culture in North America, (47) 529.
 - alfalfa seed production, (42) Utah 807.
 - Alphelinus semiflavus, (48) 753.
 - aluminum, factor in soil acidity, (44) 125.
 - ammonium citrate solutions, (43) Mich. 113.
 - Amoeba meleagridis, (41) 686.
 - amphibians, internal secretions, (45) 373.
 - anaerobes, pathogenic, (45) 481.
 - anaerobic infection, (45) 579.
 - anaphylaxis, (43) 471, 780.
 - animal breeding in North Africa, (42) 560.
 - animal diseases, (45) 176.
 - animal diseases, tropical, (47) 80.
 - Anopheles plumbeus, (43) 55.
 - anopheles, relation to malaria, (45) 555.
 - ants, feeding habits, (43) 851.
 - aphids, (49) 559.
 - apple—
 - and thorn skeletonizer, (49) Conn. State 557.
 - aphids, (41) N.Y.Cornell 850.
 - orchard fertilization, (44) W.Va. 639.
 - pollination, (46) 39; (47) 744.
 - sooty blotch, (46) 552.
 - tissue, darkening, (50) Calif. 410.
 - apples, Russian, in America, (48) 238.
 - apricot diseases, (47) 49.
 - Arceuthobium spp., (43) 821.

Bibliography of—Continued.

- arsenicals, (49) U.S.D.A. 450.
- arsenicals and mixed sprays, (45) 45.
- artichokes, culture, (49) 37.
- Ascaris lumbricoides*, (43) U.S.D.A. 275.
- Ascaris lumbricoides* and *Ascaris suilla*, (48) 179.
- azofication, (41) 125.
- Bacillus pyogenes*, (43) 582.
- Bacillus welchii*, (43) 275.
- bacteria—
 - classification, (44) 517.
 - iron-depositing, (42) 575.
 - life cycle, (50) 728.
 - rôle in plant diseases, (43) 444.
- bacterial activities of soil, effect of salt, (49) 321.
- banana weevil, (47) 659.
- bark beetles, (48) Miss. 652; (50) 255.
- Bayer 205, action, (48) 879.
- bean beetle, Mexican, (47) Colo. 56; (50) 759.
- bean ladybird, (43) U.S.D.A. 456.
- beans, growth, relation to humidity and temperature, (47) 831.
- beans, insects affecting, (47) N.Y.Cornell 848.
- beehole borer of teak, (47) 856.
- beekeeping, (44) 856.
- bees, diseases, (50) 158.
- bees, language of, (48) 857.
- bees, North American, (45) 762.
- bees, olfactory sense of, (45) 461.
- bees, sex development, (41) 847.
- beriberi, (46) 257.
- biocenology, (42) 128.
- birds, (47) 81.
- birds—
 - biology of, (50) 355.
 - British, (44) 651.
 - diving, (41) 660.
 - of Kansas City region, (41) 753.
 - of Minnesota, (41) 454.
 - of Montana, (45) 550.
 - of North Carolina, (42) 847.
 - of North Dakota, (50) 452.
 - of South Dakota, (46) 245.
- blackberry psyllid, (49) N.J. 353.
- blackleg bacillus, (45) 882.
- blackleg immunization, (44) 182.
- blood analysis, (43) 205.
- blood sugar, (45) 507.
- botryomycosis, (43) 181.
- boys' clubs, (50) 298.
- bread making, use of apples and pears in, (43) 64.
- bumblebees of central Europe, (43) 851.
- butter, fishy flavor in, (50) Wis. 280.
- cabbage worm in Wisconsin, (42) 156.
- cables in soils, heating, (48) 618.
- cacao thrips, (47) 54.
- cactus, prickly pear, (45) 69.
- camphor tree and products, (44) 44.
- carbohydrates, intermediary metabolism, (50) 361.

Bibliography of—Continued.

- carbon as an adsorbent, (43) 412.
- carbon dioxid in soil, (43) N.Y.Cornell 813.
- carbon tetrachlorid, anthelmintic value, (49) 77.
- castration, (48) 674.
- cattle, blood morphology, (47) 486.
- cecidia, (45) 763.
- cereal rust in Iowa, (46) 449.
- cestodes from fishes, (41) 455.
- cestodes of dogs and cats, (43) 80.
- cheese pests, control, (48) Calif. 253.
- chemistry, (41) 501.
- chemistry, reading courses, (43) 801.
- Chermesidae, (50) 556.
- Chinese white-wax scale, (49) 355.
- chondriosomes, (41) 727.
- chromosome number of *Zea mays*, (45) 222.
- chromosomes, (45) 222.
- chrysanthemum midge, (43) 362.
- Chrysopidae, (49) N.Y.Cornell 154.
- citrus black fly, (44) U.S.D.A. 455.
- citrus fumigation, (44) U.S.D.A. 251.
- climate of South America, (46) U.S.D.A. 17.
- Clostridium botulinum*, effect on nervous system, (50) 683.
- clover aphid, (48) 854.
- Coccidae, identification, (45) 254.
- Coccinellidae, (45) 361.
- colloid chemistry, (41) 801; (49) 109.
- Collyricium faba*, (44) 158.
- colon-typhoid intermediates, (49) R.I. 81.
- colorimetric determination of pH, (43) 211.
- Compsilura concinnata*, (41) U.S.D.A. 462.
- corn and corn products, (44) 4, 71.
- corn borer, European, (41) Conn.State 159.
- corn, genetic factors, (50) 430.
- corn silage, nitrogen losses in, (45) U.S.D.A. 266.
- cornstalk borer, larger, (45) 59.
- cotton, (43) 828.
- cotton—
 - aphid, (43) Tex. 759.
 - boll weevil, wild, (49) Ariz. 558.
 - bollworm, pink, (43) 161; (44) 254.
 - Egyptian, culture in Southwest, (44) U.S.D.A. 734.
 - testing, (50) 234.
- cottonseed meal and hulls, (44) 266.
- cowpea weevil, (43) Tex. 561.
- cows, sterility in, (48) 380.
- crane flies, (46) N.Y.Cornell 57.
- culture media, reaction, (45) 205.
- currant, red, aphid, (41) 756.
- Cysticercus tenuicollis*, (50) 880.
- cytology, (44) 66.
- Cytospora* apple canker, (41) Ill. 157.
- dairy waste disposal, (50) N.Y.Cornell 488.

Bibliography of—Continued.

dairying, (43) 73.
 damping-off in nurseries, (45) U.S.D.A. 357.
 damselflies, (44) 352.
 dates, insects affecting, (46) 558.
 dehydrated foods, (41) 557.
 dengue fever, (50) 156.
 Dictyocaulus spp., (44) 875.
 disinfecting skins and hair, (46) 480.
 djati forest soils of Java, (49) 16.
 dragonflies, (44) 352.
 Drosophila melanogaster, (46) 661.
 Drosophilinae, (45) 858.
 dyeing, (41) 801.
 edema, cause of, (42) 761.
 effect of lime-magnesia ratio on soil, (47) Va. 625.
 egg yolk formation, (46) 173.
 eggs, preservation, (46) 877.
 Eimeria pfeifferi in pigeons, (46) 886.
 electricity on the farm, (50) 287.
 embryology of the chick, (42) 562.
 emphysema, enteromesenteric bullular, (49) 284.
 emulsions and emulsification, (49) 109.
 endocrine glands, (45) 468.
 entomology, American economic, (45) 852.
 enzymes of microorganisms, (48) 675.
 Ephydra subopaca, (46) N.Y.Cornell, 751.
 epizootic lymphangitis, (42) 568.
 erythrocytes in horse diseases, (47) 487.
 essential oils, refractive indices, (42) 713.
 Eustrongylus gigas, (49) 177.
 farm tenancy in United States, (45) Tex. 593.
 Farmers' Bulletins of U. S. Department of Agriculture, (41) 298.
 fat chemistry, (46) 613.
 feeding stuffs trade, (41) 176.
 fields experiments, standardization, (48) 830; (50) 733.
 flax, culture and processing, (50) 536.
 flax flea-beetle, (48) 460.
 flea-beetles, (48) 359.
 flies, effect of food, (50) 457.
 flour, offal content, (43) 314.
 flour strength, relation to enzym action, (48) 505.
 food chemistry, (43) 563.
 forestry for the farm, (44) 147.
 forestry in France, (44) 742.
 forestry, international, (49) 342.
 forests of West Africa, (43) 840.
 fowlbrood, European, (43) U.S.D.A. 59.
 foxes, parasites of, (46) 686.
 fruit fly, (42) 655.
 fruit flies, Japanese, (42) 653.
 fruit tree leaf roller, (49) Mont. 853.
 fruits, hardness, (45) 638.
 fruits, preservation in transit and storage, (47) U.S.D.A. 830.

Bibliography of—Continued.

fungus insects and hosts, (45) 253.
 Fusarium and associated fungi in cereal diseases, (47) 647.
 gardens, form and design, (43) 236.
 gastric secretion, (49) 363.
 girls' clubs, (50) 298.
 glues and gelatins, (44) 503.
 Gnathosotomidae, revision, (44) 684.
 gooseberry mildew control, (47) 650.
 grain pests, parasitic hymenoptera on, (46) 558.
 granary weevil, (47) 659.
 grapevine flea-beetles, (44) U.S.D.A. 460.
 grasses as paper making material, (43) 317.
 grasshopper poison bait, (48) 154.
 Habronema megastoma, (48) 86.
 habronemoses of horses, (49) 283.
 heat-regulating mechanisms of body, (45) 671.
 Hemiptera-Heteroptera, (49) 252.
 heredity, (42) 560.
 Hessian fly in Kansas, (50) Kans. 54.
 hickory borer, painted, (46) 250.
 home economics, (50) 695.
 hookworm disease, (48) 151.
 hop insects, (41) N.Y.Cornell 162.
 horse breeding in France, (42) 375.
 horses, (43) 173.
 house fly, control, (50) 255.
 humin acids, (43) 214.
 hydrogen-ion concentration, (41) 204.
 hydrogen-ion concentration, determination, (45) 11.
 hydrology, (42) 572.
 Hymenoptera, parasitic, (47) 660.
 inbreeding, (41) 866.
 inbreeding and outbreeding, (42) 866.
 industrial waste, treatment, (45) 592.
 inheritance of fasciation in corn, (42) 34.
 insect transmission of diseases, (43) 450; (47) 552.
 insect-borne diseases of plants, (44) 159.
 insecticides, (49) U.S.D.A. 551.
 insecticides, adulteration, (43) U.S. D.A. 353.
 insects—
 affecting hawthorn, (48) 153.
 affecting sugar cane, (44) 159.
 anatomy and physiology, (45) 453.
 attacking metals, (48) U.S.D.A. 556.
 chemotropic response, (43) 554.
 control, (50) 254.
 in Brazil, (50) 51.
 nutritional studies, (43) 51.
 of Sweden, (50) 153.
 invertebrates, hematophagous, (48) 649.
 Ipidae, North American, (46) Miss. 461.
 Japanese beetle control, (50) N.J. 56.

Bibliography of—Continued.

- joint-ill, (42) 680.
 June beetle, green, (45) N.C. 363;
 (47) U.S.D.A. 854.
 land tenancy in Spain, (50) 91.
 land tenure, (42) 190.
 larch, (41) 345.
 larch diseases, (44) 347.
 lead determination in biological material, (49) 113.
 leaf roller, red-banded, (44) U.S.D.A. 458.
 Lecanium hesperidum, (50) 255.
 Lepidoptera, corpora allata of, (44) 59.
 leucosis of fowls, (49) 81.
 lice, (41) 458; (43) 51, 852.
 life zones of Alabama, (46) U.S.D.A. 245.
 light sources in plants, (42) 630.
 limberneck in poultry, (44) 379.
 lime, (45) 817.
 lunar periodicity in reproduction, (50) 510.
 lungworms, (47) 587.
 Lygocerus spp., (45) 456.
 lymphangitis, epizootic, (43) 583;
 (45) 881.
 Macrosiphum solanifolii, (41) Va.Truck 664.
 Malta fever, (50) 684.
 mammals of Panama, (43) 850.
 mammary apparatus, (45) 67.
 meat poisoning, (42) 273.
 melon aphis, (43) Tex. 759.
 melon fusarirose, (47) 46.
 Metarrhizium isopliae, pleophagy of, (43) 858.
 meteorological literature, (48) 614.
 meteorology of Argentina, (50) 208.
 microorganisms, (44) 342.
 microsporidian parasites, (47) 257.
 milk, (42) 564.
 milk—
 biorized, (43) 877.
 fat content varied by feed, (46) 680.
 nutritive efficiency, (44) 560.
 production, (49) 876.
 secretion, relation to diet, (46) 878.
 milking machines, (42) 773.
 mineral metabolism, (50) 664.
 molds on cold storage meat, (50) 763.
 Monophlebinae, (48) 459.
 moor soils, effect of water level on rooting of plants, (43) 623.
 mosaic disease, (48) 346.
 mosquitoes, chemotropism, (47) N.J. 554.
 moss rose origin, (46) 842.
 mountaineers, southern, (45) 593.
 mucormycosis in swine, (49) 381.
 mushrooms, (41) 834.
 muskrat, (41) 56.
 Myioidaria, parasitic on birds, (47) 555.

Bibliography of—Continued.

- Myxosporidia, (45) 453.
 negro migration, (46) 191.
 nematodes of Barbary, (49) 482.
 nicotine dust, (50) 255.
 nitrification in natural soils, (41) 125, 126.
 nitrification of semiarid soils, (43) 216.
 nitrifying bacteria, (43) 216.
 nitrogen—
 fixation, (41) 219; (42) 219; (48) 519.
 fixing power of soil, (50) Utah 119.
 industry, (43) 324.
 Kjeldahl determination, (45) 614.
 Notodontidae of Japan, (48) 553.
 nutrition, (46) 295.
 nutrition in France during the war, (42) 456.
 oats, growth, effect of seed treatment, (50) 737.
 Oenothera, (42) 128.
 oestrus and ovulation in mammals, (50) 531.
 oils, ethereal, (45) 9.
 olive fly, (48) 157.
 ophthalmology, (50) 379.
 organic matter in soils, (49) N.Y. Cornell 117.
 Orthoptera, (48) 154.
 paper making materials, (45) 511.
 paper research literature, (42) 12.
 paralysis, bulbar, in cattle, (48) 181.
 parasites of Pieris brassicae, (48) 158.
 parathyroid glands, (45) 770.
 parthenogenesis, occurrence and causation, (46) 222.
 Passerella, revision of genus, (44) 56.
 peach twig moth, (49) Calif. 53.
 pear pollen, (46) 39.
 peat materials, (42) U.S.D.A. 328.
 pellagra, (42) 463, 761; (45) 65.
 perfumes, (45) 9.
 persimmons, (42) Calif. 346.
 phenology, (42) 511; (44) 17.
 phosphatids, (46) 11.
 Phyllophaga parasites, (42) 550.
 phylloxera, (45) U.S.D.A. 57.
 pineal body, (45) 770.
 Piroplasma mutans, (45) 886.
 piroplasms, classification, (43) 883.
 plant diseases—
 and pests, (45) 541; 746.
 dissemination, (41) 840.
 fungus, (47) 43.
 insect carriers, (47) 552.
 of Canada, (44) 48.
 plant improvement, (45) 741.
 plant protection, (50) 142.
 plants, naturalization, (50) 526.
 plants, poisonous, (43) Can. 380.
 plastids, origin, (46) 722.
 poison ivy, (50) 181.
 populist movement in Georgia, (49) 93.
 Portland cement, setting, (49) 485.

Bibliography of—Continued.

- potash, (48) 24.
- potash deposits of Alsace, (44) 129.
- potash industry in 1919, (44) 515.
- potash resources of Nebraska, (44) 724.
- potassium extraction from rocks, (42) 625.
- potassium recovery at cement plants, (42) 815.
- potato—
 - leaf roll, (41) 451.
 - leafhopper, (41) 849; (48) 356; (50) Iowa 155.
 - Rhizoctonia, (43) 47.
 - wart disease, (46) 550.
- poultry breeds, large and small, (50) 430.
- poultry houses, (41) N.J. 386.
- project methods in education, (49) 194.
- proteus group organisms, (41) 84.
- protozoa of New Jersey soils, (43) 218.
- protozoology, (44) 373.
- Psithyrus and hosts, (47) 857.
- Psyllia mali, (49) 153.
- Psyllidae, (44) 59, 353.
- Pulvinaria innumerabilis, (46) 246.
- pyotherapy, (41) 375; (43) 580.
- rain water, nitrogen in, (44) 811.
- rancidity in fats, (50) 610.
- range management, (41) U.S.D.A. 565.
- rats, protozoal parasites of, (43) 883.
- reconstruction in Canada, (41) 792.
- red spider mites, (48) Calif. 461.
- red spiders, (42) 551.
- refrigeration, (42) 589.
- rhinoceros beetles, (46) 560.
- rice stem borer, (42) 56.
- ricketts, (49) 365.
- ricketts, experimental, (50) 63.
- ringing of peaches, (42) 639.
- root formation, (43) 836.
- roses, (44) 45.
- roundworms, (45) 654.
- rubber brown bast, (49) 446.
- rubber culture, (43) 344.
- rural—
 - communities, (43) 595.
 - libraries, (47) 798.
 - sanitation, (46) 782.
 - schools, consolidation, (43) 298.
 - social life and recreation, (44) 892.
- saccharin, (45) 62.
- salmon, spoilage in, (49) 803.
- San José scale, control, (44) Mo. 857.
- Sarcocystis tenella, (49) 682.
- Sarcoptes equi, (49) 381.
- sardines, canning, (44) U.S.D.A. 556.
- sawfly of Europe, (43) U.S.D.A. 364.
- scale insects, (50) Mo. 257.
- school lunches, (45) 61.
- schools, consolidation, (48) 599.
- Scobicia declivis, (48) U.S.D.A. 556.
- scurvy, (44) 362.
- scurvy in World War, (46) 261.
- Scutellerioidea of Iowa, (44) 352.
- selection, (41) 866.

Bibliography of—Continued.

- sewage purification, (45) 691.
- sewage sprinkler nozzles, (48) 387.
- sewage treatment and disposal, (42) 789.
- sex ratio, (41) 866.
- sheep maggot-flies, parasites of, (48) 256.
- silicate rocks, use as potassic fertilizer, (49) 817.
- silkworm diseases, (44) 353; (49) 154.
- sodium chlorid affecting trees, (43) 344.
- soils—
 - acidity, (42) 623; (43) 212; (45) 812; (49) 513.
 - acidity in India, (46) 812.
 - bacteria, effect of moisture, (44) 316.
 - extracts as affected by fertilizer salts, (43) Mich. 125.
 - moisture as affected by mulches, (49) 318.
 - moisture, capillary movement, (43) U.S.D.A. 724.
 - potassium liberation, (43) 128.
 - soiling crops for cows, (41) Iowa 181.
- soils—
 - bacteria in, (50) 516.
 - colloidal condition, (41) N.Y. Cornell 123.
 - forest, of Java, (49) 16.
 - of eastern Germany, (43) 320.
 - of Egypt, (48) 814.
 - red, (44) 212.
 - reduction potentials, (43) 422.
- Sorospora uvella, (42) 652.
- soy beans, nutritive value, (42) N.Dak. 161.
- spotted fever, Rocky Mountain, (43) 60.
- stable fly, (46) 661.
- Stephanurus dentatus, (49) 787.
- stink-bug, southern green, (44) 549.
- strawberries, (44) 146.
- strawberry weevil, (49) Ark. 554.
- Strongylus tetracanthus, (50) 81.
- strychnin, toxicity to rodents, (46) 655.
- sugar beet insects, (44) 351.
- sugar cane—
 - beetles, (48) 358, 360.
 - froghopper blight, (46) 154.
 - insects of Porto Rico, (44) 847.
 - irrigation, (50) 484.
 - moth borer, (41) U.S.D.A. 61.
 - varieties, (46) 835.
- sugar deterioration, (48) 314.
- sugar determination, (42) 416.
- sulphur bacteria, (44) 133.
- sulphur requirements of soils, (48) Tex. 517.
- sulphur, value in agriculture, (50) 20.
- sweet clover seed production, (43) U.S.D.A. 640.
- sweet potato weevil, (50) Tex. 760.
- swine diseases, (45) 182.

Bibliography of—Continued.

- Tachinidae, (45) 656.
 tapeworms in lambs, (48) 679.
 taste, physiology and psychology of, (46) 563.
 tea leaf rollers, (47) 658.
 teff grass, (45) 133.
 thyroid and pituitary glands, correlation, (43) 771.
 Thysanoptera of North America, (50) Fla. 660.
 tick paralysis, (45) 883.
 tick resistance in cattle, (43) 182.
 ticks, (44) 858.
 tillage, (42) 132.
Tipula oleracea, (50) 255.
 tobacco, (44) 16.
 tobacco, flower anomalies, (41) 736.
 tomatoes, breeding experiments, (43) Ind. 835.
 tomatoes, ripening process, (43) U.S.D.A. 834.
 tractor books, (46) 385.
 tractor hitches, (49) Calif. 287.
 tropisms, animal and forced movements, (42) 846.
 trypanosomes of cattle, (46) 484.
 tsutsugamushi disease, (42) 451; (46) 560.
 tubercle bacilli, avian, from a pig, (47) 586.
 tuberculosis, (46) 182.
 tuberculosis in France, (45) 77.
 Typha insects, (46) N.Y.Cornell 465.
 vanilla, (44) 238.
 vegetables, preservation in transit and storage, (47) U.S.D.A. 830.
 viruses, filterable, (50) 78.
 vitamins, (44) 63, 860; (46) 256, 469; (47) 62.
 vitamins and rickets, (46) 257.
 vitamins, symbiotes, and auximones, (41) 558.
 walls, concrete retaining, construction, (43) 485.
 wasps, Philippine, (42) 551.
 water glass, (50) 615.
 water requirements of crops, (50) 735.
 wheat foot-rot disease, (42) 244.
 wireworm, false, (50) 850.
 women in industry, (45) 94.
 women on the farm, (41) 492, 592.
 wood, chemistry, (43) 617.
 wood, dicotyledonous, intercellular canals in, (45) 46.
 wood waste, utilization, (46) 114.
 woods of the world, (46) 737; (49) 440.
 woods of United States, (43) 443.
 worms and insects, (50) 51.
 worms, parasitic, (48) 550.
 zinc occurrence in human body, (42) 758.
 zoology, (43) 250.
 Bichlorid of mercury, *see* Corrosive sublimate.
 Bikukulla spp., poisonous properties, (48) 674.
 Bile—
 formation, effect of internal secretions on, (41) 172.
 salts, effect on respiration, (48) 124.
 use for immunization against rinderpest, (45) 76.
 Billbugs—
 cocklebur, biology, (49) 56.
 food plants and distribution, (46) 560.
 habits of, (43) 762.
 Binder, homemade header attachment, (41) 487.
 Binder-twine fibers, (41) U.S.D.A. 639.
 Bindweed, control, (41) 537; (42) Calif. 823; (49) 136, Calif. 136, Kans. 427; (50) 533, Kans. 539.
 Bingham plastometer, use, (50) 417.
 Biocenology, discussion, (42) 128.
 Biochemical—
 methods, manual, (46) 612.
 procedure, application to plants, (50) 21.
 Biochemistry—
 of plants, treatise, (49) 218.
 principles, (44) 308.
 treatise, (45) 819; (48) 827.
 Bioclimatic law—
 discussion, (42) 545; (43) U.S.D.A. 718; (45) 454.
 effectiveness of applying, (43) U.S.D.A. 509.
 in research and practice, (41) 16.
 paper on, (44) 851.
 Bioclimatic zones, U.S.D.A. (45) 720, 721.
 Bioclimatics, intercontinental problems, (46) 114.
 Biocolloids—*see also* Colloids.
 action of bases and salts on, (45) 820; (48) 824.
 as membranes, (48) 825.
 hydration of, simulating protoplasm, (45) 333.
 swelling, measurement, (44) 727.
 Bioenergetics, treatise, (43) 521.
 Biological—
 control, discussion, (50) 657.
 normal spectrum, (41) 428.
 products, productions and inspection, (45) 578.
 Society of Washington, early days, (42) 249.
 survey of Alabama, (46) U.S.D.A. 245.
 training, value in education, (44) 296.
 Biology—
 civic and economic, textbook, (47) 195.
 dictionary of scientific terms, (45) 299.
 elementary, textbook, (46) 696.
 of home and community, treatise, (50) 694.
 papers on, (42) 559.
 pathological, treatise, (47) 583.
 physicochemical foundations, treatise, (45) 201.

Biology—Continued.

- plant, treatise, (50) 626.
- quantitative method, (45) 218.
- Biometrical methods, (50) 128.
- Biometry, medical, and statistics, treatise, (50) 729.
- Biomyia lachnosternae*, parasite of white grubs, (42) 550.
- Biophysics, introduction, treatise, (47) 363.
- Biorizator, Lobeck, experiments with, (43) 877.
- Bios—
 - and vitamin B, supposed identity, (49) 857.
 - relation to yeast growth, (47) 266.
 - synthesis by yeast, (50) 363.
- Biosteres javanus* n.sp., description, (47) 761.
- Biotite, potassium content, (50) 521.
- Biprorulus bibax*, notes, (41) 551.
- Birch—
 - borer, bronze, notes, (50) Conn.State 50.
 - canker, notes, (41) 752.
 - canoe, root habit, (41) 634.
 - for wood-block pavement, (41) 790.
 - frustum form factor, (41) Vt. 47.
 - fuel value, (48) 783.
 - heart rot, notes, (48) 249.
 - in sphagnum bogs, (48) 641.
 - leaf skeletonizer, notes, (41) Conn. State 159; (49) 50.
 - leaves and twigs, feeding value, (45) 774.
 - pollen distribution, (41) 46.
 - tingitid, life history, (50) 453.
 - yellow, mycorrhizas on, (48) 725.
 - yellow, relation to Adirondack Forest, (45) 350.
 - yellow, wood analysis, (42) 7.
- Birches—
 - as affected by sodium chlorid, (43) 344.
 - ray structure and wound reaction, (48) 525.
- Bird—
 - censuses in United States, (49) U.S.D.A. 652.
 - censuses, value and taking, (49) U.S.D.A. 151.
 - Day and Arbor Day material, (47) 897.
 - day books, (47) 599.
 - dogs, training and management, (47) 671.
 - houses, directions, (44) 494.
 - life, importance, treatise, (49) 151.
 - study in elementary schools, (44) 494.
 - Treaty, Migratory, U.S.D.A. (43) 449; (45) 452; (46) 555.
- Birds—
 - ailments, accidents, and treatment, (48) 486.
 - as affected by the war, (42) 748.
 - attacking tent caterpillars, (43) 250.
 - Australian, parasites of, (50) 356.

Birds—Continued.

- banding, instructions, (45) U.S.D.A. 148.
- beneficial and mischievous, treatise, (47) 356.
- beneficial to agriculture, (43) 659.
- biology of, treatise, (50) 355.
- body temperature, (47) 251.
- British, list, (43) 50; (50) 252.
- cage, manual, (48) 250.
- captive wild, treatise, (50) 885.
- color production in feathers, (46) 73.
- community refuges for, (46) U.S.D.A. 456.
- conservation, (45) U.S.D.A. 754.
- conservation laws of Maryland, (49) 250.
- course of study, (43) 397.
- course on, teaching, (41) 597.
- desert, in Great Basin, (46) 851.
- development of cloaca in, (47) 81.
- diving, of North America, (41) 660.
- domestic, new bacterial species pathogenic for, (42) 478.
- domesticated, diseases of, (42) 680.
- economic, handbook, (41) 56.
- fed on polished rice, respiratory quotient, (44) 172.
- game, breeding, (48) 851.
- game, of British Islands, (50) 355.
- habits, at Lake Burford, (44) 451.
- houses and nesting boxes, (46) 245.
- in flight, (48) 748.
- in France, treatise, (48) 456.
- in Queensland, (46) 49.
- in savage Sudan, (49) 847.
- index to genera, (44) 546.
- inland, treatise, (50) 355.
- knowing through stories, (48) 851.
- land, of Illinois, (49) 151; (50) 553.
- male, feminized, (41) 269.
- metabolism in, (50) 174.
- migration, (41) 547; (45) 358.
- migrations, relation to foot-and-mouth disease, (50) 380, 786.
- migratory—
 - game, local names, (50) U.S.D.A. 150.
 - movements, (49) U.S.D.A. 351.
 - protection, (41) U.S.D.A. 660.
 - refuges and shooting grounds, (46) 851.
 - treaty act, U.S.D.A. (43) 449; (45) 452; (46) 555.
- native, Mallophaga of, (46) 456.
- nestling, attacked by parasitic larvae, (44) 553.
- nests, Chinese edible—
 - amino sugar of, (46) 802.
 - proteins of, (46) 801.
- new species from Porto Rico, (44) 849.
- nomenclature, (41) 250, 354.
- North American gulls and terns, life histories, (46) 151.

Birds—Continued.

- North American, migration, (46) 456, 851.
 North American petrels and pelicans, life histories, (48) 150.
 of Australia, (44) 348; (46) 49.
 of British Guiana, treatise, (41) 546.
 of Cuba, (50) 252.
 of Desecheo Island, Porto Rico, (42) 51.
 of eastern Canada, descriptions, (42) 451.
 of eastern United States, (45) 754.
 of eastern United States, treatise, (49) 251.
 of Egypt, list, (44) 56.
 of field, forest, and park, popular account, (41) 547.
 of Glacier National Park, (41) 55.
 of Great Britain, and eggs, (44) 248; (46) 151.
 of Great Britain, bibliography, (44) 651.
 of Great Britain, food habits, (41) 454.
 of Great Britain, treatise, (42) 847; (44) 158.
 of India, (50) 252.
 of India, treatise, (50) 356.
 of Iowa, (41) 753.
 of Iowa, raptorial, (41) 846.
 of Kansas City region, (41) 753.
 of La Plata, treatise, (45) 654.
 of Minnesota, (41) 454.
 of Montana, (45) 550.
 of Netherlands, (50) 355.
 of North America, (41) 547, 846; (42) 847; (43) 50; (44) 248, 849; (45) 358; (47) 251.
 of North and Middle America, (41) 547.
 of North Carolina, (42) 847.
 of North Dakota, (50) 452.
 of northwest Australia, (41) 753.
 of Ohio, food habits, (50) Ohio 553.
 of Pacific coast, treatise, (50) 843.
 of prey, diurnal, synoptical list, (43) 250.
 of Pribilof Islands, (49) U.S.D.A. 652.
 of Royal Palm Hammock, list, (45) 358.
 of South Africa, treatise, (50) 252.
 of South Dakota, (46) 245.
 of Sumatra, (42) 847.
 of Tambelan Islands, (42) 847.
 of the Americas, catalogue, (42) 847.
 of the vineyard, (41) 59.
 of town and village, (42) 847.
 of Washington City, (41) 547.
 of West Virginia, (50) 754.
 on a farm, (46) 349.
 outdoor study, (46) 456.
 parasitism by fly larvae, (42) 157.
 physiology of reproduction, (46) 267; (50) 867.

Birds—Continued.

- portraits and habits, treatise, (46) 456.
 production of eye color in, (43) 866.
 protection and introduction in Queensland, law, (48) 549.
 protection, directory of officials for, U.S.D.A. (42) 354; (44) 248; (46) 151; (48) 51; (50) 355.
 raising in orchards, (46) 741.
 respiration calorimeter experiments, (46) 172.
 rooms and cages, construction, (48) 250.
 saving, at lighthouses, (48) 51.
 song, parasite of, (44) 158.
 southern, nature study book, (41) 597.
 species protected in Egypt, (41) 353.
 sterile hybrids, (47) 374.
 territorial dominion, (46) 245.
 utility, (49) 50.
 value on farm, (45) U.S.D.A. 755.
 western, treatise, (50) 754.
 wild, laying periods and egg production, (48) 172.
 wild, propagation, treatise, (50) 355.
 wild, protection of, report, (43) 50.
 Bismuth iodoform paste in wound treatment, (41) 83, 475.
 Bison, *see* Buffaloes.
 Bitterns from salt pans in Cape Province, analyses, (49) 726.
 Bituminous—
 materials, bitumen content, (43) 389.
 materials, consistency tester, (41) 789.
 materials, ultramicroscopic examination, (41) 688.
 road materials, treatise, (43) 186.
 road surfaces, efficiency, (41) 688.
 road surfaces, use in Ohio, (42) 892.
 Black—
 cutworm, *see* Cutworm, black.
 disease of sheep, etiology, (45) 685; (46) 281; (48) 485.
 flies, control, (49) N.H. 352.
 flies, paper on, (48) 252.
 fly, cattle-infesting, morphology and biology, (48) 156.
 fly in Cuba, (49) 253.
 locust poisoning of chickens, (46) 686.
 medic, culture experiments, (49) Tex. 429.
 medic pods, digestion coefficients, (42) 263.
 scale—
 control, (42) 645; (45) 660; (46) 749; (48) 152; (50) 663.
 in California, control, (47) 759.
 in California, parasite of, (46) 53.
 parasite, life history and introduction, (45) 360.
 parasite, new, rearing, (45) 559.
 parasites, (47) 363.
 parasites, method of liberating, (45) 861.

Black—Continued.

- skimmer, eye of, notes, (42) 355.
- wattle ashes, analyses, (43) 324.

Blackberries—

- breeding experiments, (43) 536; (41) 145, 533, S.C. 533; (46) 39; (48) 445.
- canned juices, for jelly making, (47) Calif. 614.
- culture, (44) Wash. 43; (45) Mo. 641; (50) 543.
- culture and marketing, (43) 40.
- culture and propagation, (45) Mo. 238.
- culture experiments, (44) Alaska 336; (47) Okla. 831.
- diseases and pests, (45) Mo. 238.
- effect of temperature on resistance to wounding, (43) U.S.D.A. 39.
- evergreen, culture and care, (42) Wash. 536.
- fertilizer experiments, (49) Oreg. 532.
- genetic status, (45) Vt. 641.
- hardy varieties, (45) 742.
- insects affecting, (43) Wash. 155; (44) Mo. 754; (45) 655.
- Logan, analyses, (41) U.S.D.A. 111.
- of New England, (44) Vt. 237.
- potash fertilizers for, (41) Mass. 21.
- pruning, (45) 44, 837; (48) Mich. 342.
- spraying schedule, (44) Mo. 535.
- storage temperature, (47) Calif. 640.
- training and harvesting, (44) Wash. 237.
- varieties, (47) Ark. 740.
- varieties for Missouri, (44) Mo. 536.
- variety for Minnesota, (41) 147.
- variety tests, (49) Idaho 740.

Blackberry—

- anthracnose, (43) Wash. 155.
- canker, studies, (47) 250.
- crown gall, (46) 543.
- diseases, control, (43) Ill. 847.
- fungus disease, (48) 351.
- gall, (43) Wash. 155.
- giant, of Colombia, description, (45) 140.
- mosaic, notes, (49) Oreg. 755.
- orange rust, new type, (50) 353.
- orange rust, notes, (43) Wash. 155; (44) 54, Conn.State 150; (50) 149.
- plantations, establishment and care, (49) Oreg. 742.
- psyllid, life history and habits, (49) N.J. 353.
- roots, resistance to freezing, (44) N.Y. Cornell 821.
- sirup preparation, (48) Calif. 507.
- thrips, notes, (47) Fla. 656.
- vines, cause of failure, (44) Calif. 744.

Blackberry-dewberry hybrid, (43) 438.

Blackhead—

- fireworm, control, Mass., (47) 452; (50) 659.
- fireworm on cranberry, (47) U.S.D.A. 456.
- in chickens, (43) 586.

Blackhead—Continued.

- in turkeys, (41) 685; (42) Calif. 887; (46) 485, 687; (48) 183; (49) 382; (50) Mont. 885.
- in turkeys—
 - effect of ipecac in treatment, (45) 386.
 - epidemiology, (43) 475.
 - transmission, (43) 885; (45) 484.
- nature and cause, (47) 487.
- of poultry, (48) Mich. 396.
- parasite, flagellate character and reclassification, (43) 476.

Blackleg—

- aggressin, immunization with, (45) 784.
- and gas gangrene, relation between, (42) 380.
- antiserum, production and potency, (47) 880.
- antiserum, standardizing, (44) 182.
- bacillus, biology, (45). 882.
- bacillus, growth in culture media, (42) 379.
- control, (44) 579; (45) 881.
- control in Alabama, (42) 776.
- detection in bone marrow, (48) 774.
- diagnosis and immunization, (44) 780.
- diagnosis, selection and shipping of material, (45) 381.
- differentiation from similar pathological conditions, (49) 680.
- etiology, (45) 480.
- germ-free filtrate, antigenic value, (44) 76.
- hematological researches in, (47) 384.
- immunization, (41) 777; (42) 74, 476; (43) 471; (44) 182, Kans. 278; (45) 180, 580, 584; (46) 579; (49) 78, 282; (50) 881.
- immunization—
 - products, grading, (50) 682.
 - with culture filtrate, (42) Calif. 881.
 - with germ-free filtrate, (46) 180.
 - with pseudoblackleg pellets, (43) 382.
 - with toxins, (48) 878.
- in cattle, summary, (49) Mont. 480.
- in sheep, outbreak in Montana, (42) 381.
- infection by ingestion, (43) 685.
- normal precipitins for, (44) 679.
- popular account, (45) 281.
- prevention, paper on, (42) 877.
- review of literature, (45) 481.
- summary, (42) Mont. 881; (50) U.S.D.A. 79.
- toxin and toxic endocarditis, (46) 481.
- treatment and cure, (44) 375.
- vaccine, liquid, production, (47) 880.
- vaccine, standardization and use, (42) 568.
- vaccines, production and use, (49) Kans. 680.

Blackquarter in camels, (41) 86.

Blacksmithing, farm, treatise, (46) 287.

Blacktongue—
disease of dogs and pellagra-like syndrome, (47) 285.
studies, (50) 284, 586.

Bladder—
as affected by scorbutic diet, (43) 665.
nematode, course in host, (44) 858.

Blanfordia nosophora, resistance to desiccation, (42) 776.

Blapstinus—
pimalis, notes, Ariz., (42) 357; (44) 548.
spp. on peppers, (48) 652.

Blasia pusilla, spermatogenesis in, (44) 427.

Blast furnace—
dust, *see* Flue dust.
potash recovery from, (41) 325, 518, 629; (43) 28; (47) 219.

Blastodacna putripennella, notes, (42) 152.

Blastomyces farciminosus, action of disinfectants on, (48) 675.

Blastomycosis of nasal mucous membrane of horses, (48) 883.

Blastophaga—
and fig family, symbiosis, (44) 660.
female, notes, (41) 556.
grossorum, life history, (43) Calif. 238.
insects, wintering, (47) 339.

Blastothrix—
brittanica, notes, (45) 459.
sericea, notes, (43) 252.

Blatella germanica, notes, (42) Minn. 358; (47) Conn.State 156.

Blatta orientalis, control, (42) Minn. 358.

Blattidae of Panama, studies, (42) 546.

Bledo, poisonous to livestock, (44) Ariz. 581.

Blepharipa scutellata, parasitism by, (46) 457.

Blepharospora—
cambivora, notes, (43) 448.
terrestris, new name, (46) 241.

Blight—*see also specific hosts.*
sources of infection, (48) 846.

Blissus leucopterus, *see* Chinch bug.

Blister—
beetles in Kansas, (46) U.S.D.A. 158.
beetles, notes, (44) Oreg. 850.
canker, Illinois, control, (49) Iowa 747.
mite, control, (49) Mont. 251.
mite, paper on, (47) 849.

Blood—
acetone determination, (43) 205.
agar, heated, nutritional value, (50) 281.
alkaline reserve—
after hemorrhage, composition, (42) 368, 465.
as affected by diet, (41) 765.
as affected by malt, (42) 463.
alkalinity determination, (42) 614.

Blood—Continued.

amino acids, relation to milk proteins, (46) 74.
ammonia concentration in, (41) 616.
ammonia determination in, (41) 413, 617; (42) 614; (47) 409.
analysis—
and applications, (47) 482.
calcium determination in, (50) 312.
incineration of organic matter for, (44) 114.
methods, (41) 13, 617; (42) 712; (43) 205; (45) 414; (46) 807.
quality of sodium tungstate used in, (47) 410.
system, (47) 410.
treatise, (48) 808.
and blood vessels in scurvy, (46) 474.
bactericidal action, (41) 577.
bactericidal titer, relation to antibodies in serum, (44) 276.
calcium content, (44) 64.
calcium content during pregnancy, (49) 765.
calcium content, increasing, (42) 758.
calcium determination in, (43) 204; (45) 316, 415, 507; (46) 416; (47) 14.
carbon dioxid content as affected by high altitudes, (43) 565.

catalase—
as affected by saccharin, (44) 462.
before and after anesthesia, (42) 259.
content as affected by muscular work, (47) 167.
content, variations in, (43) 569.
catalytic power, (41) 172.

cells, red—
hemolysis with milk, (45) 207.
hydrolytic cleavage products, separation, (50) 108.
specific gravity, (50) 680.
changes due to fatigue, (41) 860.

charcoal, adsorbent power compared with Norit, (45) 15.

chlorid determination in, (44) 506, 614; (45) 15, 414, 415.

chlorin content after ingestion of salt, (46) 174.

chlorin in, determination, (42) 712.

coagulation, inhibition by nematode secretions, (45) 477.

composition, variations in, (43) 264.

constituents, (45) 382.

constituents as affected by muscular exercise, (46) 475.

constituents, relation to deficient diet, (50) 274.

corpuscles—
and plasma, separate analyses, (47) 205.
and serum, distribution of salts in, (48) 361.

Blood—Continued.

corpuscles—Continued.

- effect of benzyl alcohol, (45) 482.
- permeability to sugar, (44) 863.
- red, calcium content, (41) 267.
- red, resistance of, (43) 63.
- creatin and creatinin in, (45) 64, 162; (47) 765; (48) 808.
- creatin content as affected by muscular tone, (45) 262.
- creatinin, (45) 64, 162; (47) 765; (48) 808; (49) 113.
- deproteinization, methods, (46) 564.
- dried, *see* Dried blood.
- enzym indices of, (45) 9.
- fat and lipid content in the Tropics, (41) 764.
- fertilizing value, (48) S.C. 621.
- filtrates, protein-free, making, modification, (50) 112.
- hemoglobin and protein content, effect of muscular work, (43) 265.
- hemoglobin determination in, (49) 113.
- H-ion concentration as affected by high altitudes, (43) 565.
- H-ion concentration, determination, (42) 553.
- horse, nonspecific complement binding substances in, (42) 379.
- horse, specific gravity and hemoglobin index, (45) 483.
- inorganic—
 - constituents, determination, (41) 413.
 - phosphate in, distribution, (47) 466.
 - phosphate in rickets, (47) 467.
- iodin determination in, (44) 114.
- iron determination in, (49) 113.
- lactic acid in, determination, (45) 15.
- lecithin determination in, (48) 110.
- lipid phosphoric acid in, (48) 110.
- lipids, determination, (41) 116, 764.
- magnesium determination in, (42) 712; (43) 204; (45) 415; (46) 416; (48) 11.
- manganese content, (43) 615.
- meal—
 - amino acid content, (41) 367.
 - analyses, (41) Ind. 564; (47) 275.
 - bacterization, (42) 520.
 - digestibility coefficients, (43) 266; (48) 574.
 - feeding value, (41) Iowa 272; (43) Can. 771.
 - vitamin content, (50) Ohio 573.
- microparticles in, (45) 381.
- morphology of cattle, (47) 486.
- nitrogen determination in, (49) 111.
- nonprotein nitrogen in, (41) 116; (43) 463; (45) 11; (46) 113; (48) 860.
- normal and diabetic, glycolysis, (50) 569.
- normal antibodies in, (45) 680.
- normal, of domestic animals, (45) 382, 884.

Blood—Continued.

- of calves, agglutinins, relation to globulins, (48) 180.
- of children, calcium in, (45) 63; (46) 259.
- of children, inorganic phosphorus in, (49) 764.
- of children, phosphoric acid distribution in, (46) 259.
- of diseased cattle, studies, (44) 683.
- of equines, (49) 683.
- of fowls, fat content, (41) 773, 774.
- of healthy horses, eosinophiles in, (45) 781.
- of horses, studies, (41) 87.
- of pellagrins, analyses, (43) 668.
- of pigeons in polyneuritis, (50) 164, 860.
- of rats, effect of fasting and lack of vitamin B, (46) 62.
- of thyroidectomized animals, calcium content, (49) 765.
- ox, isolation of histidin from, (48) 313.
- phosphate in infants, seasonal tide, (49) 58.
- phosphorus determination in, (43) 204; (44) 613.
- picture in scurvy, (46) 762.
- pituitrin content as affected by thyroid feeding, (44) 699.
- plasma—
 - alkali reserve, in avitaminosis, (50) 862.
 - carbon-dioxid-combining power, factors affecting, (47) 64.
 - inorganic elements, (50) 615.
 - inorganic phosphorus in, (46) 506.
 - of horses, carbon dioxid in, (48) 778.
 - phosphate determination in, error in method, (47) 714.
- platelets—
 - as affected by vitamin A deficiency, (49) 61; (50) 565.
 - of rats, effect of vitamin A on, (49) 562.
 - rôle in natural immunity, (42) 176.
 - technique of counting, (50) 565.
- potassium and sodium in, determination, (42) 506.
- potassium determination in, (46) 416.
- preservation, (44) 806.
- preservation of samples for sugar determination, (44) 614.
- pressure—
 - as affected by high altitudes, (43) 565.
 - of dogs, (50) 884.
 - of fowls, (50) 82.
 - of horses, (41) 287, 579.
 - of laboratory animals, recording, (43) 879.
 - raising, (43) 79.
- proteins, determination, (43) 205.

Blood—Continued.

- proteins, regeneration, (41) 859.
- reaction during mental work, (49) 560.
- regeneration following anemia, (44) 564, 565, 566; (45) 862.
- regeneration, studies, (42) 367.
- serum—
 - antagonistic action of salt in, (42) 176.
 - calcium determination in, (44) 114.
 - constituents, separating, (45) 203.
 - diffusible calcium in, (46) 203.
 - globulin determination in, (48) 9.
 - protein content, (42) 866.
 - refractive index, variations, (42) 262.
 - tryptophan content, (45) 311.
 - ultraspectroscopic studies, (42) 176.
- slaughterhouse, acquisition and utilization, (42) 161.
- slaughterhouse, dehydration of, (44) 461.
- sodium determination in, (45) 112; (46) 416.
- sugar—
 - and ovulation, relation, (50) 867.
 - content, effect of glucose, (50) 164.
 - determination, (41) 13, 413, 505, 506; (42) 712; (44) 506, 614; (45) 110, 111, 208, 507; (47) 506; (49) 14; (50) 806.
 - determination and distribution, (45) 507.
 - determination, McLean method, criticism, (49) 806.
 - effect of carbohydrates on, (44) 465.
 - estimation, technique, (49) 408.
 - in pigeons, increase, (48) 273.
 - nature of, (49) 715; (50) 765.
 - of diabetics, nature, (49) 715.
 - studies, (45) 208, 382.
 - variation in, (43) 265; (47) 263.
 - variation in avitaminosis, (49) 565.
- transfusion—
 - and foot-and-mouth disease, (48) 481.
 - in domestic animals, (49) 178.
 - in horses and cattle, choice of donors, (47) 879.
 - in hyperimmunization against rinderpest, (45) 883.
- ultraparticles of, (47) 80.
- urea determination in, (41) 116; (43) 416; (47) 612.
- uric acid determination in, (44) 806; (47) 14, 315.
- use in food, (42) 254.
- vaccines, germ-free, preparation and preservation, (44) 681.
- volume, determination by carbon monoxid, (42) 210.

Blood—Continued.

- work, treatise, (41) 184; (45) 780.
- zinc content, (42) 758.
- Blowflies—*see also* Calliphora spp.
 - on meat, protection against, (46) 57.
 - parasites of, life history, (45) 458.
 - remedies, (43) 258.
 - spraying as preventive, (44) 854.
- Blue grass—
 - as hog pasture, (41) Ohio 178.
 - breeding experiments, Can. (48) 31; (50) 433.
 - competition in mixtures as affected by fertilizers, (41) 322.
 - culture, (44) Alaska 523.
 - culture experiments, (43) Wash. 436.
 - duration in meadows, (50) N.Y. Cornell 231.
 - fertilizer experiments, (42) Minn. 826; (46) Mich. 518; (47) Pa. 429.
 - forcing germination, (44) 233.
 - germination, (46) 731; (50) 434.
 - Kentucky, life history, (49) 528.
 - Kentucky, new leaf spot, (50) 650.
 - pasture for lambs, (41) Ohio 177, 368.
 - pastures, effect of fertilizers on, (42) Va. 437.
 - preparing seed bed on denuded surfaces, (41) Ind. 130.
 - protein content at different stages, (41) Iowa 273.
 - seed, germination, (50) 740.
 - seed, marketing, Ky. (48) 129; (49) 892.
 - seed production maps, (41), U.S.D.A. 236.
 - varieties for hay, (41) Alaska 30.
- Blue grasses, analyses, (41) Wyo. 333.
- Blue tit, food habits, (41) 454.
- Blueberries—
 - as affected by salt, (46) 733.
 - breeding experiments, (42) Minn. 834.
 - cultivated, development, (47) 642.
 - culture, (43) Mass. 147; (44) Minn. 739; (46) U.S.D.A. 140; (47) Mass. 441.
 - culture experiments, (50) Minn. 133.
 - culture in Minnesota, (46) 539.
 - fertilizer experiments, (44) 237.
 - Florida variety, (41) 445.
 - propagation, (43) N.H. 36; (44) Minn. 739.
 - wild, selection, (47) Minn. 338.
- Blueberry—
 - Katherine, new hybrid, (45) 347.
 - maggot, summary, (49) Me. 657.
- Bluetop, native—
 - as hay and silage crop, (41) Alaska 30.
 - as hay crop, (44) Alaska 328.
- Blueweed eradication, (47) Tex. 436.
- Bobolink, range and economic status, (41) 547.
- Body—
 - development of successive offspring of same parents, (49) 568.
 - fluids, sugar determination in, (43) 416.

Body—Continued.

- human, as working mechanism, (46) 756.
- measurements, relation to vital capacity of lungs, (47) 164.
- organs, changes in relative weights, (50) 773.
- surface area, calculating, (47) 165.
- tissues, manganese determination, (43) 615.
- weight and longevity, (50) 562.

Bog—

- clover, eradication studies, (44) Oreg. 826.
- forest in British Columbia, (47) 836.
- forests, destruction and replacement, (49) 239.
- ore, fertilizing value, (45) 519.
- soils, effect of rotation on crop yield, (43) 231.
- soils, treatment, (41) 230.
- water, colloidal properties, (43) 224.
- water, toxicity of, (43) 224.
- xerophytes and soil toxins, (50) 627.

Bogs—

- oxygen content of water, effect of cloudiness, (46) 632.
- sphagnum, birch succession in, (48) 641.

Boiler, small domestic, heat transference and combustion tests in, (49) 688.

Boletinae and woody substances, relation, (45) 732.

Boletus, edible, nutritive value, (41) 557.

Boll weevil, *see* Cotton boll weevil.Bollworm—*see also* Cotton bollworm.

- on corn, control, (43) Mo. 757.
- on corn in New South Wales, (41) 57.
- on geraniums, (41) Fla. 548.

Bomb for ammonia synthesis, (42) 707.

Bombus—

- dahlbomii, biology, (47) 260.
- queens, confined, breeding experiments, (50) 259.

Bombyliidae, new genus, (45) 361.

Bombyx—

- mori, *see* Silkworm.
- rubi, absence of complement in blood, (41) 754.

Bonavist beans—

- breeding experiments, (45) 33.
- notes, (48) Guam 228.

Bone—

- and blood meal for pigs, (41) Iowa 272.
- architecture, laws of, (41) 269.
- ash, zinc content, (41) 464.
- black, color and ash absorption, (48) 505.
- black, decolorizing action, (49) 506.
- cells, structure and multiplication, (46) 263.
- development, studies, (41) 269.
- flour as mineral supplement, (44) Ohio 175.

Bone—Continued.

- flour for pigs, (41) Ohio 178.
- formation, rôle of calcium in, (47) 576.
- glue as feed for pigs, (43) 172.
- grinders, tests, (49) 486.
- ground, analyses, N.J. (41) 24; (43) 326; (47) 28.
- ground, effect on lime requirements of soil, (44) Pa. 723.
- manures for Indian soils, (41) 816.
- marrow of cat, histological study, (46) 263.

meal—

- analyses, (42) 263, 560, Mass. 866; (43) N.J. 672, 867; (44) Mass. 671; (45) N.J. 775; (47) Mass. 274; (48) Me. 68.
- and flour phosphates, comparison, (49) 123.
- digestion coefficients, (43) 266.
- fertilizing value, (41) Del. 137, Can. 516, 518, N.C. 625, Mo. 628, 723, 814; (42) Guam 37, Calif. 812; (45) Mo. 24; (49) Kans. 427.
- nitrification, (43) 215; (46) 516.
- steamed, fertilizing value, (41) Mo. 624; (48) N.Dak. 216.
- with green manure, fertilizing value, (48) 434.

phosphates, fertilizing value, (41) Mass. 21.

resorption, relation to osteoclasts, (44) 363.

- solubility, effect of fineness, (50) 412.
- steamed, for pigs, Ohio, (45) 572, 573.
- structure, relation to faulty diet, (48) 464.

Bones—

- decalcification and regeneration, (48) 465.
- size factors, nature of, (41) 473.

Bonneto comta, parasitism by, (46) 247.

Book lice, control, (43) U.S.D.A. 53.

Books on—

- acidosis, (41) 281.
- agaves, (41) 827.
- agrarian crusade, (48) 792.
- agrarian reform, Russian, (42) 894.
- agricultural—
 - analysis, (49) 407.
 - bloc, (48) 391.
 - botany, (44) 194.
 - club, (47) 394.
 - cooperation, (41) 592; (43) 594, 895; (45) 897; (49) 391.
 - cooperation in Denmark, (43) 694.
 - cooperation in India, (43) 293; (49) 93.
 - credits system, (48) 891.
 - department of a country bank, (49) 295.
 - economics, (45) 691.
 - education, (50) 897.

Books on—Continued.

agricultural—continued.

education—

- in France, reorganization, (43) 95.
- project method, (43) 492.
- vocational, (41) 395; (49) 493.
- vocational, teaching, (46) 393.
- extension, (46) 296.
- facts and figures, (49) 193.
- holding acts, (48) 594.
- industries, (41) 417, 506, 592.
- instruction, philosophy, (45) 196.
- labor, (49) 191.
- labor in England, (44) 291.
- labor in France, (50) 292.
- labor problem in Great Britain, (41) 93, 193.
- machinery, (50) 189, 588.
- machinery in Brazil, (43) 90.
- organization in United States, (50) 590.
- prices, (43) 394.
- resources of French East Africa, (42) 896.
- Society of South Carolina, (41) 897.
- surveying, (42) 887.
- village, (48) 892.

agriculture, (44) 795; (46) 95; (48) 395, 497.

agriculture—

- American, (50) 691, 792.
- American, economic history of, (42) 286.
- and irrigation, (46) 282.
- and the community, (47) 297.
- British, (48) 94.
- chemistry of, (45) 310.
- courses in, (41) 597.
- elementary, (41) 298; (42) 195, 298, 795; (48) 693.
- for high schools, (42) 795; (50) 94.
- for Kansas common school, (50) 298.
- for teachers, (42) 396.
- history in British Isles, (41) 387.
- illustrated lessons in, (42) 598.
- in America, beginnings, (49) 191.
- in America in 1775, (41) 527.
- in Brazil, (41) 889.
- in Denmark, (41) 194.
- in early Britain, (45) 895.
- in France, (41) 294, 791, 792, 889.
- in India, (47) 596.
- in Italy, (41) 793.
- in New Town, (42) 791.
- in Russia, (41) 793, 893.
- in Serbia, (41) 294.
- methods of teaching, (45) 91.
- of to-morrow, (42) 687.
- primary, (41) 596, 597.
- secondary, (41) 95.
- substances important in, (50) 311.
- teaching, (44) 794.

Books on—Continued.

agriculture—continued.

- tropical, (41) 194; (46) 32; (48) 297; (49) 96.
- air and its ways, (49) 614.
- alcohol and carbohydrates, (44) 409.
- alcohol as motor fuel, (49) 286.
- Algeria, (50) 93.
- alkali industry, (41) 210.
- alkali, soil, (44) 210.
- alkali soils, reclamation, (50) 321.
- alkaloids, (50) 201.
- allotment holdings in England, (41) 693.
- analytical methods, standard, (47) 108.
- anatomy of domestic animals, (41) 279; (44) 481.
- anatomy, pathological, (44) 577.
- animal—
 - biology, elementary, (41) 896.
 - breeding and feeding, (47) 865.
 - breeding in North Africa, (42) 560.
 - diseases, (44) 577, 678; (45) 176, 278, 381; (46) 276; (47) 283; (49) 278.
 - diseases and bacteriology, (49) 177.
 - diseases, clinical diagnosis, (50) 379.
 - diseases, evolution, (46) 374.
 - diseases in New Zealand, (50) 76.
 - diseases, tropical, (45) 477; (47) 80.
 - foods, (43) 593.
 - husbandry, (43) 494.
 - life as affected by man, (45) 55.
 - life in deserts, (50) 355.
 - life in field and garden, (48) 549.
 - light, nature of, (45) 550.
 - nutrition, (50) 266.
 - parasites, (49) 377; (50) 554.
 - parasites and human disease, (48) 253.
 - pests of orchard, garden, and ornamentals, (49) 654.

animals—

- and their environment, (49) 756.
- captive wild, diseases, (50) 885.
- domestic, (49) 278, 377.
- domestic, pathological anatomy, (46) 681; (50) 379.
- injurious and beneficial to agriculture, (42) 451.
- of Glacier National Park, (41) 55.
- venomous and venoms, (47) 846.
- wild, (48) 549.
- young, diseases, (49) 782.
- young, hygiene and nutrition, (49) 772.
- Antirrhinums, (43) 441.
- Antirrhinums and Pentstemons, (45) 838.
- ants, (45) 762; (49) 453.
- apple industry of North America, (45) 741.

Books on—Continued.

- apple trees, (46) 735.
- apples, boxed, marketing, (50) 393.
- arboriculture in Spain, (41) 237.
- architecture and building (46) 691.
- architecture, domestic, (45) 186.
- arithmetic, household, (46) 95.
- artichokes, culture, (47) 736.
- atmospheric circulation, (49) 614.
- automobile, gasoline, (49) 85.
- bacteria, pathogenic, (42) 878.
- bacteriology, (41) 874; (42) 474; (44) 576, 678; (46) 78, 578, 880; (49) 125, 625; (50) 478.
- bacteriology—
 - agricultural, (46) 124, 221; (49) 819; (50) 526.
 - agricultural and industrial, (47) 9.
 - and animal diseases, (49) 177.
 - blood work, and animal parasitology, (41) 184; (45) 780.
 - pharmaceutical, (45) 477.
 - principles, (46) 374.
 - technique, (50) 180.
 - veterinary, (48) 773.
- baking technology, (49) 114.
- balsams, analysis, (44) 806.
- bananas, (45) 837.
- bank agricultural department, (49) 295.
- beef production in England, (42) 868.
- beekeeping, (43) 57, 661; (44) 356; (45) 461; (46) 254, 463; (47) 259; (48) 50, 255; (49) 660, 762.
- bees, (41) 463; (42) 56; (47) 58, 362; (50) 359, 762.
- beet sirup manufacture, (44) 507.
- beet sugar manufacture, (45) 807.
- beetles, (50) 359.
- beetles and spiders, British, (41) 455.
- beetles of Europe, (42) 854.
- belt conveyors and elevators, (50) 189.
- berries and berry wines, (41) 739.
- beverages, (41) 467.
- biochemical methods, (46) 612.
- biochemistry, (45) 819; (48) 827.
- biochemistry of plants, (49) 218.
- biochemistry, treatise, (44) 308.
- bioenergies, (43) 521.
- biology—
 - civic and economic, (47) 195.
 - elementary, (46) 696.
 - of home and community, (50) 694.
 - pathological, (47) 583.
 - physicochemical foundations, (45) 201.
 - quantitative method, (45) 218.
- biometry, medical, (50) 729.
- biophysics, (47) 363.
- biotechnology of meat, fat, and milk production, (42) 263.
- bird dogs, (47) 671.
- bird life, importance, (49) 151.
- birds, (41) 56, 454, 546, 547, 597; (46) 245; (47) 356; (48) 486, 851.

Books on—Continued.

- birds—
 - and the war, (42) 748.
 - biology of, (50) 355.
 - British, (43) 50; (44) 158, 248; (46) 151.
 - British, nests and eggs, (42) 847.
 - cage, (48) 250.
 - captive wild, diseases, (50) 885.
 - domesticated, diseases of, (42) 680.
 - game, of British Islands, (50) 355.
 - in flight, (48) 748.
 - in France, (48) 456.
 - in town and village, (42) 847.
 - inland, (50) 355.
 - of eastern United States, (45) 754; (49) 251.
 - of India, (50) 356.
 - of La Plata, (45) 654.
 - of Netherlands, (50) 355.
 - of Pacific coast, (50) 843.
 - of South Africa, (50) 252.
 - portraits and habits, (46) 456.
 - western, (50) 754.
 - wild, propagation, (50) 355.
- blacksmithing, (46) 287.
- blood analysis, (48) 808.
- botanical equivalents, dictionary, (45) 427.
- botanical microtechnique, (50) 626.
- botanical names and terms, (50) 627.
- botany, (41) 96, 697; (43) 818; (45) 426; (46) 322; (47) 97; (49) 125.
- botany—
 - agricultural, (46) 95, 221; (48) 827.
 - Australian forest, (50) 195.
 - history of, (45) 218.
 - of living plants, (44) 130; (50) 727.
- botulism, (50) 167.
- bread making, (47) 261.
- bridges, (44) 85; (46) 286; (50) 387.
- bridges, suspension, (48) 682.
- building construction, (45) 394.
- buildings for farm animals, (42) 590.
- bulbs, (47) 239.
- butter, (50) 679.
- butter industry, (43) 779.
- butter making, (42) 269; (46) 275; (48) 80.
- butterflies and moths, (50) 257.
- butters, (45) 801.
- calcium requirement for man and animals, (42) 260.
- camp nutrition, mess officers' manual, (42) 658.
- canals and conduits, diagram for discharge, (48) 486.
- canning, (45) 462.
- canning and preserving, (42) 113.
- canning, cold pack method, (42) 616.
- canning, commercial, (42) 113.
- capillaries, anatomy and physiology, (50) 379.

Books on—Continued.

- carbohydrates and alcohol, (44) 409.
- carbohydrates and glucosids, (43) 410.
- castration, (45) 881.
- catalysis and industrial application, (45) 201.
- catalysis in theory and practice, (42) 802.
- catalytic hydrogenation and reduction, (41) 310.
- catalytic reactions, (49) 109.
- cattle—
 - dairy, feeding and management, (43) 176.
 - diseases, (47) 483.
 - feeding, (47) 76.
 - foods, microscopic analysis, (42) 469.
 - Shorthorn, breeding, (47) 669.
- cavy culture, (42) 770.
- cellulose—
 - bleaching, (47) 207.
 - chemistry, (47) 502.
 - esters, (45) 204, 801.
 - hydrolysis, (46) 203.
- cement, (46) 888; (48) 589.
- cereals, culture, (47) 823.
- cheese making, (42) 269, 270; (43) 272; (46) 275.
- cheese manufacture in Netherlands, (44) 372.
- chemical—
 - analysis, (46) 111; (47) 108, 801; (49) 110.
 - analysis, standard methods, (47) 108.
 - French, (45) 108.
 - preparations, (49) 608.
 - technology, (49) 608.
 - terms, (44) 801.
- chemical-technical analysis, (48) 312; (49) 110.
- chemicals, (41) 613.
- chemicals, organic medicinal, (45) 278.
- chemistry, (42) 310; (43) 201, 609, 697; (44) 409; (45) 108, 410; (47) 201, 696, 801; (49) 110, 202, 608.
- chemistry—
 - agricultural, (41) 501; (43) 10, 898.
 - analytical, (46) 310.
 - and physics, (45) 801.
 - applied, (41) 710; (45) 201; (49) 608, 801.
 - biological, (41) 407; (45) 801.
 - colloid, (41) 310; (48) 801.
 - elementary agricultural, (41) 896.
 - food, (43) 10.
 - history of, (48) 801.
 - horticultural, (50) 201.
 - household, (46) 296.
 - industrial organic, (48) 801; (50) 801.
 - of building and machine materials, (43) 389.
 - of crop production, (45) 114.

Books on—Continued.

- chemistry—continued.
 - of engineering, (46) 778.
 - of leather, (43) 617.
 - of plant life, (45) 501.
 - of starch and cellulose, (42) 409.
 - organic, (41) 10; (42) 310; (45) 201, 310, 713; (46) 9.
 - organic and biological, (49) 801.
 - organic, catalysis in, (48) 411.
 - pharmaceutical organic, (46) 202.
 - physiological, (44) 556, 610; (46) 859; (47) 501.
 - vocational, (46) 95.
- chestnuts, (49) 837.
- chicks, development, (42) 562.
- chlorophyll, (41) 525.
- chrysanthemums, (41) 448.
- church and community survey of Pend Oreille Co., Washington, (49) 94.
- church and community survey of Salem Co., New Jersey, (49) 94.
- church in town and country, treatise, (50) 794.
- citrus culture in Florida, (49) 438.
- civic biology, (41) 598.
- climates of the continents, (48) 508.
- climates of the world, (50) 807.
- cloth, weaving, dyeing, and finishing, (50) 695.
- clothing, (46) 95.
- coconuts, (45) 743; (47) 642.
- coffee, (48) 447.
- Coleoptera illustrata, (41) 62.
- colloid chemistry, (45) 108, 610; (46) 501; (48) 801; (50) 709.
- colloidal behavior and proteins, (49) 109.
- colloids, (49) 109.
- colloids—
 - formation, (46) 9.
 - in biology and medicine, (41) 680.
 - physics and chemistry of, (42) 109; (48) 801.
 - soil, (49) 414.
- colorimetric analysis, (46) 709.
- columns, (48) 89.
- commerce and industry, (44) 393.
- community civics and rural life, (47) 598.
- community organization, (46) 789.
- concrete—
 - construction, (41) 584; (42) 580, 851, 685; (43) 188, 889; (46) 688.
 - designing, (46) 85.
 - manufacture and use, (49) 484.
 - products, (50) 186.
 - reinforced, (43) 289; (48) 682; (50) 485.
 - roads, construction, (50) 587.
 - work, (44) 784.
- conifers, (41) 244, 652; (50) 344.
- conifers, characteristics, (43) 650; (45) 45.
- conifers, dwarf and slow-growing, (50) 242.

Books on—Continued.

construction equipment, (47) 189.
 cooking, (41) 68; (42) 458; (43) 494; (45) 93, 697.
 cooking in quantity, (42) 863.
 corn growing, (43) 638; (45) 92; (50) 694.
 corn plant structure, (49) 528.
 corn trade, British, (45) 192.
 cosmetics and perfumes, (50) 308.
 cost of living in Philadelphia, (44) 859.
 cotton, (41) 531; (45) 342; (46) 391; (49) 528; (50) 694.
 cotton spinning tests, (48) 32.
 country church, (41) 387.
 country newspaper, (49) 595.
 cows and milk production, (50) 577.
 cows in health and disease, (42) 273.
 crop production, (46) 29.
 crops and tillage, (46) 696.
 Cucurbitaceae, (50) 727.
 cytology, (44) 66; (46) 823.
 dahlias, (47) 41.
 dairy—
 bacteriology, (45) 880.
 chemistry, (46) 113.
 cows, feeding, (42) 269.
 farming, (49) 778; (50) 94, 676.
 farming in Great Britain, (45) 380.
 plants, management, (44) 778.
 products, manufacture, (45) 679.
 products, production and trade, (49) 376.
 products, technical control, (48) 275.
 record and feeding chart, (43) 176.
 dairying, (42) 269, 496; (43) 580; (46) 73; (48) 273, 877; (49) 778; (50) 780.
 dams, design and construction, (47) 790.
 Delphiniums, (50) 141.
 Denmark, (46) 292.
 desiccation of Africa, (44) 208.
 diagnostic methods, (46) 880.
 diet deficiency diseases and vitamins, (48) 162.
 dietetics for high schools, (44) 898.
 dietotherapy, (43) 261.
 diseases, carriers of, (48) 379.
 disinfection, (46) 310.
 distemper, canine, (48) 86.
 distillation, (47) 501.
 distillation, fractional, (47) 204.
 dogs, breeding and care, (49) 373.
 dogs, diseases and treatment, (48) 182.
 drainage, (43) 280; (44) 381, 685; (47) 88.
 drainage and sanitation, (47) 392.
 drainage laws, (41) 482.
 drainage systems, tile, (42) 577.
 drug plants, culture, (42) 538; (43) 838; (45) 239.
 drug plants, nomenclature, (42) 43.

Books on—Continued.

drugs and galenicals, (44) 111.
 drugs, chemistry and analysis, (45) 207.
 drugs, microscopic examination, (49) 12.
 drugs, useful, (43) 580.
 dry farm crops, (42) 437.
 drying, (41) 618.
 ducks, natural history, (50) 355.
 ducks, raising, (42) 563; (48) 768.
 ducks, runner, (42) 562.
 dust explosions, (48) 90.
 dyestuffs, natural, (41) 110.
 earthwork and its cost, (43) 589.
 economic and commercial prospects of Italy, (49) 693.
 economic conditions in Philippines, (46) 895.
 economics—
 and the community, (47) 598.
 of daily life, (42) 91.
 of the household, (50) 797.
 rural, (42) 789.
 economy, national, (46) 590.
 edible fats and oils, (47) 311.
 education, social objectives, (46) 193.
 electric ranges, (49) 589.
 electrical engineering, (49) 483.
 electrical power in France, (43) 790.
 electricity, (49) 286.
 electricity in agriculture, (49) 589.
 electrons in chemistry, (50) 608.
 electrophysiology, (43) 819.
 emulsions and emulsification, (49) 109.
 encouraging repopulation and combating high cost of living, (42) 391.
 endocrine organs, (41) 172.
 endocrinology, (48) 162.
 engineering—
 civil, (42) 478; (43) 278.
 construction, (46) 888.
 construction costs, (49) 184.
 cost accounting, (46) 486.
 dredging, (43) 887.
 economics, (49) 483.
 for land drainage, (43) 280.
 formulas, design of diagrams for, (50) 586.
 highway, (42) 279; (45) 790.
 irrigation, (42) 479.
 on the farm, (49) 482.
 rural, (42) 274.
 structural, (42) 486.
 structural drafting and design, (46) 888.
 structures, (50) 286.
 testing materials, (44) 483.
 waterproofing, (43) 186.
 engines, internal combustion, (46) 891.
 English village, (48) 892.
 entomology, (43) 850; (45) 453; (48) 250; (50) 151.
 entomology—
 for medical officers, (44) 754.
 forest, (48) 252.

Books on—Continued.

- entomology—continued.
 - medical, (50) 453.
 - sanitary, (45) 658.
- enzymes, (43) 611.
- enzymes, chemistry of, (46) 9.
- epizootics, control during war, (44) 678.
- estimating cost of buildings, (43) 188.
- eugenics, (48) 564.
- eugenics and genetics, (47) 67.
- evergreens, (50) 240.
- evolution, (48) 564.
- evolution, initiative in, (45) 267.
- evolution of plants, (44) 218.
- evolution, organic, (43) 521.
- excavation engineering, (50) 286.
- excavation, machinery and costs, (42) 482.
- export packing, (46) 383.
- Fabre, J. H., (50) 253.
- fabrics, (44) 393; (50) 695.
- farm—
 - accounting, (50) 898.
 - and household helps, hints, etc., (41) 699.
 - animals, (43) 770.
 - buildings, (41) 488; (43) 592; (47) 91.
 - buildings, construction, (42) 687.
 - bureau movement, (46) 386.
 - engines, (42) 282; (49) 589.
 - fertility, (49) 510.
 - hygiene, (41) 279.
 - implements and machinery, (45) 392; (50) 189.
 - light and power, (48) 185.
 - management, (41) 592; (46) 693; (50) 590.
 - meats, (49) 570.
 - mechanics, (41) 487; (48) 395; (49) 284.
 - mechanics and livestock, (48) 497.
 - mortgage financing, (49) 594.
 - projects, (47) 696.
 - woodlands, (50) 695.
- farmers' union and federation, (42) 391.
- farming, (41) 192, 331; (43) 93, 396; (44) 495, 794; (46) 696; (47) 195, 689; (48) 297; (50) 94.
- farming—
 - costs, (46) 493.
 - for women, (41) 492.
 - hill, in England and Wales, (49) 491.
 - profitable, (42) 88.
- farms, State, (42) 490.
- fats, (47) 292, 311.
- fats and oils, animal, (45) 203.
- fats and oils, hydrocarbon, (48) 206.
- fats and oils, vegetable, (41) 110.
- fats, refractive indices, (45) 802.
- fauna of British India, (43) 50; (46) 461.
- Federal Farm Loan System, (46) 388.
- feeding of nations, (42) 755.

Books on—Continued.

- feeding stuffs—
 - and feeding, (46) 70; (47) 374; (48) 660.
 - concentrated, (43) 170.
 - microscopic control of, (43) 170.
 - wartime, (43) 170.
- fermentation, alcoholic, (50) 806.
- ferns, (43) 148.
- fertilization problems, (42) 262.
- fertilizer industry, (49) 422.
- fertilizers, (41) 21, 423, 626; (42) 20, 719; (44) 22; (48) 721.
- fertilizers and manures, use, (45) 24.
- fertilizers, manufacture, (46) 518.
- fevers in the Tropics, (42) 174.
- fiber plants of Brazil, (41) 827.
- field crops, (41) 96, 331, 730; (49) 31.
- field crops, practicum, (41) 298.
- fig recipes, (43) 261.
- filtration, (49) 202.
- filtration, industrial, (50) 612.
- fire prevention in mills and grain elevators, (47) 689.
- firewoods, (41) 449.
- fish culture, (46) 720.
- fishery industries, (50) 709.
- flax, (44) 635, 528.
- floods, remedies, (42) 682.
- floriculture, commercial, (48) 639.
- flour manufacture, (45) 663.
- flour milling, (49) 114.
- flower culture, (42) 43.
- flower gardens, English, (45) 744.
- flower gardens, making of, (42) 43.
- flowers, (46) 138; (48) 736; (50) 39.
- flowers—
 - cut, industry, (43) 838.
 - hardy border, (45) 838.
 - of Yellowstone National Park, (50) 645.
 - shrubs, etc., in California, (49) 438.
 - wild, of California, (44) 640.
 - wild, of Nantucket, (45) 239.
- food—
 - analysis and standards, (41) 558.
 - and drug analysis, (41) 412.
 - and nutrition, (42) 56.
 - and public health, (42) 253.
 - and the war, (42) 551.
 - chemistry, (43) 10; (46) 560; (49) 559.
 - chemistry and preparation, (50) 898.
 - crisis, (41) 92.
 - from grains, (42) 456.
 - industries, (44) 660.
 - industries of France, (43) 260.
 - industry, (42) 658.
 - inspection, (44) 475.
 - inspection and analysis, (43) 313.
 - microbiology, (41) 360.
 - poisoning, (43) 261.
 - preparation, (48) 193.
 - preservation, (42) 804.
 - production in Denmark, (43) 292.

Books on—Continued.

food—continued.

- production in England, (49) 389.
- production in war, (49) 290.
- products, source, chemistry and use, (46) 859.
- regulations, in Italy, (43) 65.
- resources of United States, (43) 60.
- saving and sharing, (41) 897.
- substitutes in Germany, (43) 204.
- supply, world, (42) 790; (45) 191.

foods—

- analyses and energy values, (46) 161.
- and cookery, (45) 399.
- chemistry of, (45) 862.
- drying, (45) 415.
- microbiology, (45) 462.
- microscopic examination, (49) 12.
- planning and preparation, (50) 298.

forage crops in Denmark, (46) 227.

forage substitutes, (42) 769.

forest—

- botany, (46) 221.
- insects, (50) 555.
- insects of Australia, (50) 256.
- laws, French, (46) 141.
- Lepidoptera, (48) 53.
- management, (45) 644.
- mensuration, (46) 341, 444, 739; (50) 647.
- policy of United States, (43) 746.
- regulation, American, (49) 238.
- resources of the world, (50) 141.

forestation in United Kingdom, (41) 343, 743.

forestation with conifers, (41) 652.

forestry, (41) 243, 540; (42) 43; (43) 343, 442, 542, 651; (46) 236; (47) 346; (48) 539, 739.

forestry for profit, (50) 242.

forestry in France, (44) 741.

forests—

- and forestry in West Africa, (43) 839.
- and trees, (44) 238.
- in French colonies, (42) 446; (43) 651.
- of New York State, (49) 142.
- Philippine, minor products, (48) 841.
- vanishing, (49) 341.
- woods, and trees, (42) 539.

fruit—

- and truck crops, (42) 593.
- culture, (41) 339, 340, 538, 650; (42) 238, 440; (50) 140.
- fancy, culture, (43) 743.
- growing, (43) 835; (44) 534; (47) 237.
- in the home, (42) 255.
- preserving, (43) 15.
- trees as bushes, culture, (42) 534.

Books on—Continued.

fruits, (48) 736.

fruits—

- hardy, (48) 443.
- hardy, culture, (44) 41.
- hardy, in Great Britain, (45) 135.
- industries for conservation of, (42) 615.
- insects affecting in Germany, (46) 458.
- preservation, (41) 506; (45) 665.
- pruning, grafting, and budding, (45) 135.
- small, (43) 40.
- tropical and semitropical, (41) 341; (44) 837.

fuels, (47) 292.

fungicides, (49) 51.

fungus diseases, (48) 749.

furnace heating, (50) 589.

game birds and wild fowl of British Islands, (50) 355.

garden insects and plant diseases, (42) 546.

gardening, (41) 96, 236, 298, 339, 448, 538, 648; (42) 533; (43) 697, 741, 833, 834; (44) 440, 534; (45) 43, 740, 741; (46) 838; (47) 195; (48) 635, 636, 735; (49) 836; (50) 139.

gardening—

- in New Zealand, (42) 533.
- ornamental, (47) 643.
- rôle in land development, (42) 444.
- teaching, (44) 794.

gardens, (45) 344; (49) 439.

gardens—

- form and design, (43) 236.
- historic, (49) 836.
- monthly working calendar for, (43) 236.
- of celebrities, (43) 342.
- of Switzerland, (50) 239.
- rock, (45) 441; (48) 840.
- southern, (47) 643.

gases, industrial, (43) 627.

gasoline, (46) 87.

gear wheels, (50) 687.

geese, raising, (48) 768.

gelatin and glue, chemistry of, (48) 207.

genetics, (48) 165, 468, 564.

genetics and eugenics, (47) 67.

geography—

- business, (48) 193.
- commercial, (42) 898.
- economic, (46) 295.
- political, (46) 697.

geology, (48) 16; (49) 510.

geology, agricultural, (43) 719.

geology, engineering, (45) 889.

germination, (48) 827.

glow worm and other beetles, (42) 455.

glue and gelatin industry, (45) 318.

goat keeping, (44) 776.

goats, milch, (42) 564.

goats, raising, (42) 561.

Books on—Continued.

- goats, use and management in England, (42) 265.
- grafting in India, (49) 741.
- grafting old fruit trees, (42) 534.
- grain—
 - elevators, plans, (42) 787.
 - handling, (49) 293.
 - production in western Canada, (45) 737.
 - storage, (44) 787.
- grange, work of, (46) 695.
- grapes, (41) 446, 740; (42) 41.
- grasses, (44) 827; (48) 395.
- grasses of South Africa, (41) 529.
- grasses of South India, (48) 130.
- greenhouse crop diseases and control, (48) 847.
- growth and senescence, chemical basis, (50) 569.
- gums and resins, (41) 110.
- harness repairing, (47) 793.
- harvesting machines, (42) 686.
- health education in schools, (46) 194, 898.
- health, public, (42) 863.
- heat transmission, (47) 390.
- hematology, (50) 680.
- heredity, (42) 262, 560; (43) 632; (47) 666; (48) 265.
- heredity and hormones, (47) 568.
- heredity in poultry, (49) 674.
- heredity, Mendelian, (49) 266.
- hides of colonial cattle, (42) 264.
- highway inspection, (42) 890.
- highway transportation, (50) 88.
- histology, (44) 577.
- histology, vegetable, (46) 322.
- hog cholera, (48) 181.
- home building and equipment, (47) 688.
- home economics, (41) 97, 98, 396, 896; (46) 792.
- home economics—
 - elementary, (45) 399; (46) 296.
 - methods courses, (47) 897.
 - teaching, (42) 92.
- home projects in agriculture, (42) 91.
- hormones and heredity, (47) 568.
- horse diseases, (47) 483.
- horses, (44) 185.
- horses, anatomy, (49) 381.
- horses, anatomy and physiology, (41) 87.
- horses, diseases of foot, (42) 571.
- horses' limbs, (44) 377.
- horticulture, (41) 96, 597; (42) 444.
- horticulture for schools, (48) 693.
- hotbeds and cold frames, (41) 538.
- household appliances, (41) 692; (42) 285.
- household physics, (43) 495.
- housekeeping, (43) 798.
- hybridization, cause of apogamy in plants, (42) 527.
- hydraulic tables, (44) 482.
- hydraulics, (42) 274, 572; (45) 889; (48) 183.

Books on—Continued.

- hydraulics, agricultural, (42) 274.
- hydraulics of pipe lines, (47) 288.
- hydrocarbons and derivatives, (47) 608.
- hydrogen-ion concentration, determination, (45) 11.
- hydrology, elements of, (42) 571, 681.
- hygiene, home and community, (50) 797.
- ice cream manufacture, (42) 877.
- ignition systems, automotive, (44) 786.
- immunity, (49) 78.
- immunity in infectious diseases, (44) 475.
- immunity, science of, (47) 583.
- immunity, vaccination, and serum therapy, (46) 880.
- inbreeding and cross-breeding, (42) 865.
- industrial waste, (44) 725.
- infection and resistance, (50) 581.
- insect anatomy, (50) 253.
- insect artisans and their work, (42) 249.
- insect behavior, (43) 50.
- insect pests in England, (41) 755.
- insecticides, (49) 51.
- insects, (43) 659; (45) 453, 755; (46) 49, 456; (48) 157; (50) 151.
- insects—
 - and injuries from, (46) 456.
 - and pests, (48) 749.
 - control, (50) 253.
 - economic, (41) 56; (47) 253.
 - instincts and habits, (49) 251.
 - of Sweden, (50) 153.
 - on sewage filters, (43) 853.
 - relation to man, (46) 152.
 - social life among, (50) 253.
 - transformation, (46) 456.
- irrigation, (41) 481; (43) 387; (45) 788.
- irrigation—
 - and religion, (48) 494.
 - in tropical Africa, (46) 584.
 - in tropical climates, (46) 282.
 - institutions, development, (45) 387.
- joint-ill, (47) 588.
- jute culture and manufacture, (46) 134.
- jute in Bengal, (46) 533.
- jute industry, (45) 899.
- land—
 - labor in India, (43) 293; (47) 796.
 - economics, (48) 787.
 - improvement in France, (42) 790.
 - nationalization, (49) 389.
 - ownership, (41) 387.
 - question in England, (42) 391.
 - settlement for soldiers, (41) 489, 592.
 - valuation, (49) 90.
 - values in France, (44) 388.

Books on—Continued.

- landscape gardening, (45) 441; (46) 236; (47) 746.
- larch diseases, (44) 347.
- laundering, (50) 797.
- leather chemistry, (43) 317.
- leather manufacture, (46) 313; (47) 509.
- legumes, culture, (45) 128.
- Lepidoptera, forest, (48) 53.
- lice, (41) 457.
- lime, (48) 589.
- lime, use in soil improvement, (42) 524.
- linen industry, (48) 438.
- lipoids, rôle in infection and immunity, (46) 276.
- livestock, (48) 693.
- livestock—
 - and dairy farming, (42) 263.
 - and farm mechanics, (48) 497.
 - breeding and feeding, (47) 865.
 - feeding, (44) 266.
 - industry, American, (50) 167.
 - judging, (43) 494, 697.
 - of Great Britain, (50) 670.
 - production, intensive, (44) 569.
 - types and market classes, (43) 697.
- logging, (50) 444.
- Iubin, D., (50) 89.
- lubrication, (44) 586.
- lumber—
 - and its uses, (43) 344.
 - industry in United States, (50) 344.
 - kiln drying, (45) 185; (49) U.S.D.A. 386.
 - manufacture and distribution, (47) 540.
 - manufacture in Douglas fir region, (48) 589.
 - properties and uses, (50) 838.
- lymphangitis, epizootic, (44) 477.
- malaria, (44) 552.
- mammals, domestic, (45) 870.
- mammals, South African, (46) 245.
- mammary gland structure and development, (45) 67.
- mange and allied mites, (49) 76.
- mangoes, (45) 643.
- manures, (43) 621.
- manures and fertilizers, use, (45) 24.
- margarin, (44) 258.
- market analysis, (46) 693.
- marketing, (44) 893; (45) 897; (46) 289, 593.
- marketing, cooperative, (50) 192.
- marketing, methods and policies, (46) 594.
- marketing, principles, (48) 788.
- markets, organized produce, (48) 788.
- material handling, (47) 189.
- materials, strength, (47) 389.
- mathematics, agricultural, (45) 899.
- meadows and forage plants, (42) 437.
- meadows and pastures in France, (42) 437.

Books on—Continued.

- meat—
 - hygiene, (41) 81.
 - industry, American, (50) 167.
 - industry of world, (50) 670.
 - inspection, (44) 475, 678.
 - packing and allied industries, (49) 370.
 - packing houses, (46) 491.
- meats, (49) 570.
- mechanical testing, (48) 589; (49) 887.
- mechanics, analytical, (49) 284.
- mechanics, farm, (49) 284.
- medicine, (45) 578.
- medicine and surgery, industrial, (43) 564.
- medicine, tropical, (42) 174; (44) 179.
- medicines, chemistry and analysis, (45) 207.
- metabolism, (48) 162.
- metabolism, basal, rate determination, (45) 670.
- meteorology, (43) 208; (46) 711; (50) 313.
- meteorology, agricultural, (44) 507.
- meteorology, introductory, (41) 15.
- meteorology, simplified, (50) 314.
- microbiology, (44) 576; (45) 578.
- microchemistry of plants, (47) 9.
- microorganisms, pathogenic, (42) 774; (45) 578.
- microscopy, chemical, (46) 201.
- milk, (48) 577; (49) 175.
- milk—
 - analysis and utilization, (44) 178.
 - biological properties, (42) 564.
 - clean, production, (42) 472; (43) 679; (44) 872.
 - condensed, (45) 862.
 - condensed and milk powder, (44) 373.
 - hygiene, (41) 80.
 - marketing, (45) 577.
 - prices, (44) 89.
- mineral industries, (47) 325.
- mites, parasitic, (49) 76.
- monosaccharids, identification, (47) 312.
- moor cultivation, (42) 512.
- mosquitoes, eradication, (48) 156.
- motion pictures for community needs, (47) 598.
- motor—
 - fuel, alcohol as, (49) 286.
 - fuels, (46) 87.
 - transportation, (47) 791; (50) 189.
 - trucks, (46) 890.
 - trucks, design and construction, (43) 285.
 - vehicle engineering, (42) 486.
 - vehicles, (43) 187.
- mountaineers, southern, (45) 593.
- national parks, (41) 651.
- nations, development, (48) 492.
- natural history studies, (45) 399.

Books on—Continued.

nature study, (41) 97; (42) 92.
 nature study and agriculture, (44) 898.
 nature teaching, (42) 92.
 negro slavery, American, (41) 890.
 Nile control, (48) 286.
 nitrogen, atmospheric, fixation, (47) 320; (48) 425.
 Nonpartisan League, (46) 292.
 nucleic acids, (45) 203.
 nurseries, (42) 534.
 nursery, small, establishment, (50) 540.
 nut growing, (46) 40.
 nutrition, (47) 363; (50) 852.
 nutrition—
 and clinical dietetics, (50) 762.
 diseases and infant feeding, (42) 660.
 in France during the war, (42) 456.
 of children, (47) 766.
 Pirquet system, (48) 462.
 oil cakes in animal feeding, (44) 363.
 oil plants, culture, (44) 137.
 oils, (41) 10, 110, 501; (47) 292, 311.
 oils—
 and fats, hydrocarbon, (48) 206.
 essential, and perfumes, (42) 8.
 essential, refractive indices, (42) 712.
 fats and waxes, (45) 410, 501, 801; (49) 608.
 hydrogenation of, (42) 409.
 refractive indices, (45) 802.
 vegetable, (43) 240; (46) 202.
 olive culture, (41) 837.
 ophthalmology, veterinary, (47) 878.
 organic evolution, (43) 521.
 organic syntheses, (43) 501; (50) 709.
 ornithology, (45) 754.
 Orthoptera of northeastern America, (43) 851.
 osiers and willows, (41) 345.
 otters, (50) 355.
 oxidation and reductions in animal body (48) 411.
 painting, principles and practices, (50) 590.
 pansies, culture, (44) 45.
 parasites and parasitosis of domestic animals, (43) 580.
 parasites, animal, (46) 456; (49) 177.
 parasitocides, (44) 22.
 parasitology, (48) 774; (49) 76, 177.
 parasitology, human, (44) 577.
 parks and gardens, (42) 539.
 parrots, (48) 250.
 Pasteur, (45) 680; (48) 673.
 pastures of New Zealand, (45) 127.
 pathology, (50) 180.
 pavements, construction, (44), 784.
 peach culture, (41) 445.
 pears of New York, (48) N.Y.State 537.
 peat, (41) 518, 814.
 peat industry, (43) 129.

Books on—Continued.

pellagra, (42) 761.
 perfume and aromatic plants, (42) 43.
 perfumes and cosmetics, (50) 308.
 perfumes and essential oils, (42) 8.
 pharmaceutical and food analysis, (49) 407.
 pharmacy, (42) 379.
 pheasants, (45) 851; (48) 550.
 physical fitness, assessment, (47) 164.
 physics of the air, (44) 617.
 physiology—
 chemical, (43) 365; (44) 556; (49) 358.
 human, biochemistry in relation to, (49) 559.
 of domestic animals, (46) 681.
 pathological, (44) 678.
 principles, (42) 658; (46) 255.
 pigeons, diseases and feeding, (42) 779.
 pigeons, evolution, heredity, and behavior, (43) 67.
 pigeons, flying homer, (46) 173.
 pigeons, raising, (49) 297.
 pigs, (47) 195.
 pigs and bacon curing, (49) 470.
 pigs, Duroc-Jersey, history, (43) 71.
 pigs, raising, (42) 268, 561; (50) 869.
 pine, southern yellow, (42) 580.
 plant—
 biochemistry, (47) 522; (50) 626.
 biology, (48) 192; (50) 626.
 breeding, (45) 35, 734; (46) 829; (47) 823; (48) 829; (49) 735.
 cells, chemistry, (50) 427.
 diseases, (44) 642; (45) 540; (46) 238.
 diseases and pests, (46) Calif. 238.
 diseases, bacterial, (48) 142.
 diseases, immunity, (45) 840.
 diseases, nonparasitic, (46) 843.
 growth and soil conditions, (46) 809.
 improvement, (48) 836.
 indicators, (45) 525.
 life and growth, (49) 836.
 life in New Zealand, (46) 222.
 movements, (46) 528.
 physiology, (42) 626; (46) 126.
 production, (41) 396.
 products, chemistry of, (48) 801.
 plants—
 culture, (45) 438; (46) 720.
 culture in greenhouse, (48) 447.
 flowering, (43) 148.
 forcing, (50) 834.
 hardy perennial, (48) 41.
 heredity and evolution in, (45) 426.
 house, (50) 543.
 organic compounds, nature and significance, (45) 201.
 ornamental, (49) 439; (50) 39.
 ornamental, pruning, grafting, and budding, (45) 135.

Books on—Continued.

- plants—continued.
 - propagation, (47) 235.
 - wild, useful, (41) 742, 743.
 - wild, uses, (43) 649.
- plaster, (48) 589.
- plumbing, modern, (48) 91.
- polysaccharids, (45) 310; (49) 803.
- pomology, (47) 832.
- pork production, (44) 571.
- potash, (50) 724.
- potash, occurrence and use, (48) 24.
- potash production in United States, (43) 728.
- potatoes, (44) 436; (48) 337.
- potatoes, culture, (43) 829; (47) 736.
- potatoes, production in North America, (48) 795.
- poultry, (41) 597, 676, 869; (46) 95; (47) 496, 671; (48) 373; (50) 576, 676.
- poultry—
 - breeding, (46) 272; (47) 175.
 - diseases, (48) 183, 382.
 - feeding and feeds, (48) 768.
 - feeding, rational, (42) 268.
 - inheritance in, (49) 674.
 - raising, (42) 268, 471; (43) 174, 494, 676; (46) 768; (49) 171.
- preventive medicine and hygiene, (46) 859.
- project method of teaching, (46) 193.
- prophylaxis of animal diseases, (46) 579.
- prosperity in 1920, (43) 92.
- protein metabolism, (46) 563.
- protein therapy, (49) 78.
- proteins and theory of colloidal behavior, (49) 109.
- proteins, colloid chemistry of, (47) 501.
- protozoa of man, (47) 383.
- protozoa, pathogenic, (42) 878.
- protozoology, (43) 659; (44) 373; (46) 78.
- pulpwood and wood pulp, (50) 545.
- pumping machinery, (42) 480.
- quit-rent system in American colonies, (43) 694.
- rabbits, (44) 369.
- rabbits, breeding and care, (42) 268.
- rabbits, raising, (43) 174, 873.
- rainfall of British Isles, (47) 511.
- range management, (50) 167.
- reagents, (45) 109.
- Reclamation Service, (41) 481.
- red lead, use in paint, (46) 688.
- refrigeration, (44) 487; (47) 892.
- refrigeration, mechanical, (48) 91.
- religion and irrigation, (48) 494.
- remedies, new and nonofficial, (41) 781.
- reports, preparation, (50) 898.
- reproduction, physiology of, (48) 661.

Books on—Continued.

- research data, (49) 392.
- resins, analysis, (44) 806.
- resins, synthetic, (49) 207.
- road materials, bituminous, (43) 186.
- roads, (43) 481.
- roads and pavements, (42) 279.
- roads and pavements, rural, (45) 790.
- roads, construction, (44) 284, 784; (45) 688; (50) 286.
- rocks, chemical analysis, (41) 112.
- roses, (41) 242; (45) 348, 441, 838; (47) 344; (48) 41; (49) 438, 743, 835; (50) 239, 645.
- roses, climbing, culture, (43) 838.
- roses, culture, (42) 239, 444; (44) 45.
- rotations and crop distribution, (41) 730.
- rubber, (47) 755.
- rubber, preparation and testing, (45) 210.
- rural—
 - and forest surveys, (41) 292.
 - California, (48) 893.
 - church, (48) 493, 494.
 - church in South, (50) 494.
 - church survey, (49) 94, 893.
 - communities, (43) 894; (47) 192.
 - community activities, (49) 391.
 - community, evolution of, (49) 391.
 - development, (43) 894.
 - economics, (47) 593; (50) 891.
 - education, (50) 494.
 - Europe, (49) 191.
 - life and community civics, (47) 598.
 - life and education, (48) 496; (49) 296.
 - Michigan, (48) 391.
 - New York, (45) 291.
 - problems in United States, (45) 394.
 - reconstruction, (46) 596.
 - schools, consolidation, (43) 297.
 - science, (43) 195.
 - social life and recreation, (41) 892.
 - social organization, (45) 592.
 - sociology, (44) 791; (48) 189.
- Sabsovich, H. L., (47) 495.
- sanitation and drainage, (47) 392.
- sap ascent, physiology of, (49) 820.
- schools, Federal aid for, (46) 193.
- schools, rural, (50) 596.
- schools, rural, supervision, (46) 392.
- science for children, (44) 494.
- science, outline, (48) 498.
- science remaking the world, (50) 897.
- scurvy, (45) 266.
- seed farming in Britain, (42) 534.
- seed identification, (48) 836.
- seed industry in Germany, (49) 232.
- sericulture, (42) 546.
- serum diagnosis, (46) 276.
- sewage disposal, (41) 588.

Books on—Continued.

- sewage treatment, (47) 293.
- sewerage and sewage disposal, (46) 891.
- sewerage systems, (47) 293.
- sewing, (41) 897.
- sewing and textiles, (45) 697.
- sex determination, mechanism, (50) 530.
- sheep—
 - breeding, (46) 270.
 - breeding and feeding, (44) 571.
 - breeding, Australasian, (44) 268.
 - diseases, (44) 582; (47) 883.
 - husbandry, (41) 97; (48) 474.
 - Merino, history and breeding, (42) 770.
- shrubs of Europe, (44) 238.
- shrubs, ornamental, (49) 835.
- slime molds, North American, (50) 727.
- sociology, rural, (47) 896.
- softwood industry, (42) 349.
- soil—
 - analysis, mineralogical, (47) 810.
 - colloids, (44) 210; (49) 414.
 - conditions and plant growth, (46) 809.
 - formation and classification, (44) 417.
 - management, (41) 419, 624; (48) 817; (49) 510.
 - survey mapping, (43) 887.
- soils, (43) 621, 719; (46) 511; (47) 317; (49) 616.
- soils and agriculture of Southern States, (45) 18.
- soils and crops, (41) 96.
- soils and manures in New Zealand, (42) 511.
- soils, unproductive, (41) 624.
- soldier colonists, (41) 489, 592.
- solvents for fats, (48) 807.
- South American States, (46) 789.
- soy beans, (49) 35, 230.
- spiders, (49) 256.
- spiders, British, (50) 260.
- spraying, (50) 440.
- spraying and dusting equipment, (49) 51.
- starch products, (49) 503.
- statistics, (45) 299.
- steam power plant, equipment, (47) 888.
- steel, structural, (47) 89.
- sterilization, (46) 310.
- strawberry tree, (41) 653.
- structural design, (46) 486.
- structures, framed, (50) 688.
- Sudan, savage, (49) 847.
- sugar beets, (44) 529, 636.
- sugar manufacture, (44) 506; (47) 507.
- sugar supply of France, (41) 593.
- surgical and obstetrical operations, (42) 879.
- surveying and boundaries, laws, (49) 483.

Books on—Continued.

- surveying for settlers, (49) 334.
- sweet peas, (43) 441.
- sweet potato culture, (44) 832.
- sweet potatoes, (50) 136.
- swine diseases, (45) 182.
- swine management in the South, (41) 369.
- tanning, (47) 509.
- textile chemistry, (50) 308.
- textile fabrics, (50) 695.
- textile industry, (49) 528.
- textile raw materials, (47) 208.
- textiles, (41) 698, 897; (45) 697.
- theory of probabilities, (48) 97.
- timber identification, (44) 47.
- timber, strength, seasoning, and grading, (42) 280.
- timberlands, American, valuation, (46) 444.
- timbers, (44) 239; (47) 442.
- timbers and their uses, (42) 446.
- timbers of India, (44) 149, 743; (47) 539.
- tobacco, culture and preparation, (49) 36.
- tomato products, (41) 618.
- town v. country, (50) 892.
- toxicology, (44) 475.
- toxins and antitoxins, (45) 780.
- traction farming and traction engineering, (42) 282.
- tractor engines, (46) 890.
- tractors, (42) 282, 783; (44) 382.
- tractors and implements for 1920, (43) 287.
- trapping, (46) 455.
- tree biology, (46) 221.
- tree diseases, (44) 650.
- trees, (42) 44; (45) 741; (48) 238.
- trees—
 - and shrubs, (48) 736.
 - economic, in Great Britain, (43) 344.
 - identification, (49) 836.
 - in London, (48) 447.
 - mountain, of southern California, (42) 348.
 - of Europe, (44) 238.
 - of Nebraska, (44) 640.
 - of North America, (46) 737.
 - of the world, (44) 443.
 - of Yellowstone National Park, (50) 645.
 - shade, (49) 439.
- trench fever, (41) 851.
- tropisms, animal, (42) 846.
- tuberculosis, (45) 181; (46) 182; (48) 777; (50) 584.
- tuberculosis, chemistry of, (48) 776.
- tuberculosis of animals, (44) 278.
- tulips, doubling in, (41) 742.
- tumors, nature and cause, (42) 878.
- turkeys, raising, (47) 276.
- turnpikes of New England, (42) 891.
- twins, physiology of, (48) 868.
- vaccines and sera, (41) 283.

Books on—Continued.

- vaccines and sera, technique, (44) 475.
- vanilla culture and preparation, (44) 237.
- vegetable biology, (46) 221.
- vegetable gardening, (43) 236; (50) 740.
- vegetables, culture, (42) 38, 637; (46) 138; (48) 443, 735, 736; (49) 832; (50) 395.
- vegetables, culture projects, (47) 235.
- vegetables, preservation, (41) 298, 506.
- ventilation, (49) 591.
- veterinary—
 - bacteriology, (48) 773.
 - hygiene, (46) 773; (49) 278.
 - medicine, (43) 76, 683, 797, 879; (44) 373; (46) 178, 880; (48) 378.
 - ophthalmology, (50) 379.
 - service in the war, (46) 479.
 - studies for agricultural students, (50) 76.
 - therapeutics, (48) 774.
- vinegar from wine, (41) 618.
- violets, culture, (44) 45.
- vitamins, (45) 562; (46) 256, 863; (47) 62, 768; (48) 162.
- vitamins and artificial nutrition, (45) 464.
- vitamins and choice of food, (48) 162.
- vocational arithmetic for girls, (45) 496.
- vocational education, (45) 193, 195.
- walls, concrete retaining, construction, (43) 485.
- walnuts, (41) 742; (45) 240.
- wasps, (41) 759.
- water law, western, (42) 887.
- water purification, (41) 483, 583.
- water resources, (46) 687.
- waxes, (45) 801.
- waxes, refractive indices, (45) 802.
- weather, (43) 208.
- weather proverbs and paradoxes, (50) 415.
- weather, world, (50) 12.
- weeds, (41) 442; (45) 438.
- weeds on farm lands, (44) 833.
- wheat culture in Manitoba, (43) 640.
- wheat plant, (46) 837.
- wild flowers, bushes, and ferns, (50) 240.
- wild life in British Guiana, (41) 546.
- wild life in tree tops, (47) 356.
- wild life of Canada, (47) 356.
- wiring for light and power, (47) 391.
- wood, (46) 779.
- wood—
 - and other organic structural material, (42) 280.
 - conservation, (45) 390.
 - conservation and improvement, (49) 83.
 - distillation, (50) 587.
 - polishing and staining, (48) 784.

Books on—Continued.

- wood—continued.
 - preservation, (42) 782.
 - technical properties, (45) 83.
 - waste, utilization, (44) 687.
- woodlands, English, management, (43) 442.
- woods of Java, (41) 244.
- woods of Madagascar, (49) 440.
- woods of United States, (43) 443.
- wool, (46) 391; (47) 670.
- wool combing, (46) 72.
- wool production, Australasian, (44) 268.
- Yosemite National Park, (46) 41.
- zoology, (48) 649; (50) 252.
- zoology for medical students, (46) 773.
- zootechny, (49) 772, 782.
- Booms for spraying truck crops, (42) Va.Truck 893.
- Boophilus annulatus, *see* Cattle tick.
- Borates, elimination from American potash, (47) 728.
- Borax—
 - determination in fertilizers, (41) 799.
 - determination, methods, (42) 313.
 - effect on crops, (44) 516; (46) Conn. State 322, S.C. 717; (47) N.H. 423; (49) U.S.D.A. 324.
 - effect on growth and fruiting of cotton, (49) 217.
 - effect on potatoes, (47) U.S.D.A. 521.
 - in fertilizers—
 - crop injury from, (42) U.S.D.A. 816.
 - determination, (43) 312, 613; (44) Va. 712.
 - effect on corn, Ind. (43) 325; (45) 121.
 - effect on corn and cotton, (43) S.C. 126.
 - effect on crops, (44) Me. 129; (45) 426, 625; (46) 123; (48) N.J. 325.
 - effect on potatoes, (44) 423.
 - limits of toxicity, studies, (42) U.S.D.A. 817.
 - solubility test for caseins, (44) 809.
 - toxicity for plants, (49) 217.
- Borrbetta soil, fertilizer experiments, (42) 22.
- Bordeaux—
 - and oil emulsion spray, (42) 153.
 - dust on peach and apple orchards, (42) Va. 345.
 - mixture—
 - acid or alkaline, (41) 54; (47) 250.
 - adhesiveness, (43) N.H. 842.
 - analyses, N.J. (43) 37; (44) 440.
 - and Bordeaux-arsenate, analyses, (41) Mich. 443.
 - and casein, tests, (42) 353.
 - and lime-sulphur, comparison, (49) Iowa 746.

Bordeaux—Continued.

mixture—continued.

- apple fruit and leaf injury from, (50) 449.
- arsenic in, value, (46) Mass. 50.
- casein and ammonium sulphate in, (47) 243.
- composition, (43) 444.
- copper in, for potato blight, (44) 51.
- effect on cherry trees, (50) 300.
- effect on plants, (43) N.H. 44.
- effect on potato plants, (43) 547.
- faulty lime in, (49) 145.
- fixatives for, (47) 51.
- for potato leafhopper, (45) Wis. 553.
- fungicidal value, (41) 250, 657; (42) 48; (43) 544; (44) Ohio 151; (47) 152; (48) 848.
- homemade, tests, (47) Minn. 352.
- homemade, v. powders and paste, (47) 250.
- improved form, (42) 353.
- leaf injury from, (44) 246, Calif. 743.
- liquid v. dry, (50) N.Y. State 546.
- modified, (41) 354.
- neutral and alkaline, (41) 250.
- ordinary v. casein, (43) 550.
- poisoned, preparation and use, (41) 533.
- powdered, preparation, (50) 710.
- preparation, (44) Ark. 342; (46) U.S.D.A. 235.
- preparation and use, (43) 155.
- properties, (50) 710.
- rôle of copper in, (48) 144.
- specific insecticide for leafhoppers, (49) 654.
- stimulatory action, N.H. (48) 143; (49) 328.
- sugar in, (47) 242.
- tests, (44) Oreg. 840; (45) 146.
- use against apple anthracnose, (49) Oreg. 538.
- use against apple blotch, (49) Okla. 445.
- use against leafhopper, (50) Iowa 154.
- use of soap in, (41) N.J. 52.
- use of white arsenic in, (43) 850.
- use with linseed oil, (41) 355.
- v. Burgundy mixture, (47) N.H. 448.
- v. lime sulphur, (44) Wis. 241, 246; (49) 44.
- value against potato blight, (44) Minn. 245.
- value on potatoes, (42) Mass. 356; (48) 646.
- white arsenic in, (49) 50.
- with soap, fungicidal value, (43) Mass. 846.
- without copper, (47) 546.

Bordeaux—Continued.

oil emulsion—

- directions, (47) 153.
- preparation and application, (47) 552.
- spray, (44) 651.
- spraying experiments, (43) 157.
- value for citrus groves, (50) U.S.D.A. 239.
- paste for pruning wounds, (44) Oreg. 839.
- powders v. homemade mixture, (44) 750.
- Bordet-Gengou reaction, use, (49) 481.
- Borer, flat-headed, repellent, (49) Mich. 495.
- Borers in mesquite cordwood and posts, protection, (45) U.S.D.A. 257.
- Borers mistaken for European corn borer, (45) 759.
- Boric acid—
 - as a disinfectant, (41) 188.
 - canning powder, experiments, (48) U.S.D.A. 14.
 - determination, (41) 313; (43) 413.
 - disinfecting power, (43) 78.
 - effect on molds, (45) 463.
 - effect on nitrogen-fixing powers of *Azotobacter chroococcum*, (48) 817.
 - estimation in foods, (50) 805.
 - for ammonia neutralization, (47) 310.
 - in fruit juices, (49) 805.
 - preserved food poisonous to chickens, (50) 788.
 - solutions, reaction with alcohols and sugars, (45) 509.
 - use in nitrogen determination, (42) 802.
- Borkhausenien *diveni* n.sp., description, (45) 156.
- Borna disease—
 - etiology, (42) 571; (46) 485.
 - immunization, (45) 686.
 - in Argentina, (41) 480.
 - in mules, (43) 83.
 - of horses, etiology, (44) 280; (45) 888.
 - studies, (48) 679.
- Boron—
 - in food materials, (45) 665.
 - rôle in nutrition of maize, (41) 820.
- Borona, culture directions, (45) 35.
- Botanic Gardens, British Guiana, (44) 40.
- Botanical—
 - equivalents, dictionary of, (45) 427.
 - exploration of French West Africa, (48) 221.
 - microtechnique, treatise, (50) 626.
 - names and terms, dictionary, (50) 627.
 - researches of Carnegie Institution, (41) 25.
 - systematization, methods and aims, (43) 818.
- Botany—
 - agricultural, in secondary education, (42) 597.

Botany—Continued.

- agricultural, textbook, (45) 426.
- agricultural, treatise, (46) 95, 221; (48) 827.
- Australian forest, textbook, (50) 195.
- college, treatise, (46) 322.
- dictionary of scientific terms, (45) 299.
- economic and systematic, notes, (48) Can. 451.
- forest, treatise, (46) 221.
- fundamentals, treatise, (45) 426.
- history of, (45) 218.
- in South Africa, (47) 525.
- international catalogue, (43) 227.
- introductory, course in, (49) 97.
- of the living plant, treatise, (44) 130; (50) 727.
- problems in, paper on, (42) 748.
- relation to agriculture, editorial, (44) 104.
- specialization and fundamentals in, (47) 125.
- systematic, type concept in, (47) 28.
- textbook, (41) 96, 697; (47) 97; (49) 125.
- treatise, (43) 818.

Botflies—

- of domestic animals, summary, (47) 555.
- of Mesopotamia, (46) 59.
- of the reindeer, (47) 257.
- ox, life history, (42) 854.

Botfly, rodent, studies, (41) 258.

Bothrideridae, biology of, (42) 655.

Bothriocera sp., notes, (43) 556.

Bothryoxysta curvata, hyperparasite of aphids, (46) 463.

Botryococcus and Staphylococcus pyogenes aureus, identity, (43) 181.

Botryodiplodia—

- sorghi, notes, (47) 544.
- sp., notes, (47) 547.
- theobromae, notes, (46) 845; (49) 540; (50) 42.
- theobromae on rubber, (45) 148.
- theobromae on tea, (42) 646.

Botryomycosis, studies, (43) 181.

Botryosphaeria—

- dothidea, notes, (50) 143.
- gregaria on willow, (43) 350.
- studies, (45) 746.

Botrytis—

- antherarum trifolii, notes, (46) 832.
- bassiana, paper on, (44) 757.
- cinerea—
 - action of alkaloids on, (48) 241.
 - cell regeneration, (41) 346.
 - colorless strain, (45) 821.
 - for bean seed treatment, (49) 841.
 - H-ion concentration changes induced by, (50) 22.
 - killing Aesculus pavia, (41) 453.
 - notes, (42) 46; (43) 152, 246, 847; (44) Conn.State 150, 346, 447; (45) 649; (46) 44; (49) Calif. 649, 650, 844.

Botrytis—Continued.

cinerea—continued.

- on greenhouse lettuce, (43) Ky. 845.
- on stored corn, (49) 842.
- on strawberries, (50) 48.
- sources of sulphur for, (49) 26.
- spores, germination, (44) 28; (48) N.H. 544; (49) 125, 240.
- studies, (41) 154; (43) 750.
- utilization of glucose as source of carbon, (45) 354.
- elegans in cold storage meat, (48) 248.
- galanthina, notes, (47) 548.
- leaf spot, notes, (42) N.Y.State 350.
- new species on apples, (43) 244.
- on cherry, notes, (45) 48.
- on onion, (41) 154.
- on strawberries, notes, (43) 848.
- paeoniae, notes, (50) 355.
- sp., notes, (44) 446; (45) 541; (46) 145, 447, 544, 844, 849; (48) 47; (50) Pa. 445, 547.
- sp. on figs, (50) 751.
- sp. on tomato, (43) 656.
- spores as affected by phenol, (45) 821.
- stephanoderis n.sp., description, (49) 255; (50) 249.
- tulipae, (46) N.Y.Cornell 654.

Bots—

- carbon bisulphid for, (42) 381, 678.
- control, (49) 77.
- in horses, (41) 474; (42) 878.
- treatment, (46) 685.

Botulinus—

- antitoxin, (49) Ky. 586.
- antitoxin, review of literature, (42) 662.
- antitoxins, production, (44) 277.
- antitoxins, standardization, (45) 580.
- toxin, determination and type, (46) 467.
- toxin, precipitation with alcohol, (46) 361.
- toxin, studies, (46) 669; (47) 467.

Botulism—

- and encephalitis lethargica, differential diagnosis, (46) 262.
- and food preservation, (50) 167.
- and grass disease, (47) 186.
- and spoiled canned foods, (42) 261.
- anaesthesia in treatment, (46) 64.
- as affected by calcium chlorid, (49) 667.
- cause and prevention, (42) 558.
- cause and treatment, (46) Mich. 468.
- epidemiology, card for recording, (43) 369.
- epidemiology of, (49) 859.
- equine, (45) 882.
- equine, in Canada, (47) 884.
- from canned asparagus, (42) 57.
- from canned beets, (43) 865.
- from canned ripe olives, (42) 261, 262, 558; (43) 865.
- from canned spinach, (45) 369.

Botulism—Continued.

- from cheese, (45) 369.
 - from ripe olives, protective measures, (42) 761.
 - human, bacteriological diagnosis, (46) 262.
 - in cattle, (45) 284, 680.
 - in chickens, (43) 84; (47) 885.
 - in dogs, (48) 182.
 - in domestic animals, (49) Ky. 586.
 - in Germany, (47) 271.
 - in swine, relation to hog cholera immunization, (46) 378; (47) 387.
 - notes, (44) 264.
 - organism from cheese, (41) 170.
 - outbreak, (48) 659.
 - outbreak in Scotland, (49) 862.
 - outbreaks, (42) 262, 558; (47) 370, 771.
 - paper on, (45) 769; (48) 659.
 - prevention, (43) 168; (44) 763; (47) 67.
 - relation to forage poisoning, (41) 280, 681.
 - relation to paratuberculosis, (48) 181.
 - responsibility and prevention, (46) 571.
 - review of literature, (45) 167; (49) 366.
 - serum therapy, use of morphin in, (48) 66.
 - studies, (42) 57, 761; (43) 169; (45) 570; (49) Ill. 365, 860, 861, 862, 863.
 - summary, (48) 263.
 - treatment, (41) 682; (45) 667.
- Bouillon—**
- analyses, (47) Calif. 660.
 - cubes for culture media, (43) 329.
- Bourdillon water still, modification, (42) 8.**
- Bourgelatia diducta n.g. and n.sp., description, (41) 579.**
- Bouteloua oligostachya, analyses, (41) Wyo. 333.**
- Bovine reproduction, pathological phases, (50) 681.**
- Bovine serum, anticomplementary action, (49) 879.**
- Bovines, immunization against anaplasmosis, (43) 77.**
- Bowlders, blasting with TNT, (42) 278.**
- Box elder—**
- diameter growth, (45) 240.
 - fungus affecting, (48) 249.
 - wood, red stain in, (50) 843.
- Box leaf miner, control, (50) 559.**
- Box, Tuberculariaceae on, (43) 849.**
- Boxwood—**
- leaf midge, life history and control, (46) 750.
 - toxic properties, (47) 443.
 - Turkish, present uses, (49) 143.
- Boxwoods—**
- of commerce, (46) 445.
 - West Indian, identity, (46) 843.

Boys—

- boarding school, sitting-height and stem-length, (47) 364.
 - boarding school, size and weight, (46) 563.
 - metabolism of, (43) 167; (45) 863.
- Boys'—**
- agricultural competitions, prizes for, (41) 495.
 - club leadership, course of study for, (43) 796.
 - clubs, (50) 298.
 - clubs—
 - factors in efficiency, (45) 496.
 - 4-H, in West Virginia, (47) 496.
 - in Canada, (43) 796.
 - in Iowa, organization, (49) 96.
 - in Kansas, (46) 194.
 - in New Zealand, (46) 793.
 - in Northern and Western States, U.S.D.A. (42) 598; (49) 394.
 - in Southern States, (42) U.S.D.A. 299.
 - in United States, (43) 195.
 - making articles for household use, directions, (49) 297.
 - notes, Guam, (45) 94; (46) 793.
 - organization, (49) Alaska 491.
 - organization and results, (45) U.S.D.A. 197.
 - relation to nature study, (42) 795.
 - relation to rural homes, (46) 598.
 - results, U.S.D.A. (45) 798; (46) 393.
 - role in agriculture, (48) 896.
 - pic clubs, (47) 76.
 - State corn contest in Indiana, (43) 195.
- Brachiaria plantaginea, notes, (41) Fla. 528.**
- Brachydactylism in fowl, (42) 68.**
- Brachylaena diseases, (47) 44, 348.**
- Brachyplatys pacificus, notes, (43) 52.**
- Brachys spp., notes, (41) 555; (44) 352.**
- Brachysporium trifolii—**
- albino mutation of, (48) 29.
 - notes, (46) 743.
- Bracken—**
- as source of potash, (41) 629.
 - common, poisonous to horses, (43) 471.
 - control, (49) 33.
 - eradication, (44) 227.
 - rhizomes, feeding value, (41) 270, 271; (42) 369.
 - utilization and eradication, (41) 629.
- Bracon—**
- brevicornis, *see* Habrobracon brevicornis.
 - erythrogaster, parasitism by, (46) N.Y.Cornell 250.
 - n.sp., parasitism by, (44) 356.
- Braconidae—**
- life history, (49) 559.
 - new species, (45) 459; (47) 660.
 - parasites of flies, (42) 361.
- Bradshot and braxy, identity, (50) 683.**

Brain—

- ascaris larvae in, (47) 284.
- human, zinc and copper content, (46) 861.
- tissue feeding of white mice, effects, (44) 265.

Brains—

- of animals as food materials, (43) 63.
- zinc content, (42) 758; (45) 64.

Brak soils in the Transvaal, studies, (48) 420.

Brambles, winter injury, (50) Mass. 631.

Bran—*see also* Corn bran, Rye bran, Wheat bran, *etc.*

- active constituent, nature of, (47) 768.
- analyses, (41) 868; (42) 560, 769.
- autolyzed, as famine food, (50) 561.
- detection in shorts, (47) 408.
- standards for, (49) 65.
- with screenings, analyses, (42) Mich. 63.

Brassica—

- arvensis, chloral hydrate test, (44) 233.

campestris chinoleifera n.var., (44) 429.

- napus cake, fertilizing value, (41) 816.
- spp., cyclic manifestation of sterility in, (49) 425.

Brassolis isthmia on banana, (42) 751.

Bravaisia floribunda, durability test of wood, (43) 44.

Braxy—

- and bradshot, identity, (50) 683.
- in hares, (47) 589.
- in Scotland, (48) 774.
- vaccine, preparation, (49) 181.

Braxy-like disease of sheep, cause and transmission, (48) 485.

Brazil nut black crust, (44) 650.

Brazil nuts, vitamin content, (44) 461, 765.

Brazilian brown beans, analyses, (45) 872.

Bread—

- and milk, effect on blood, (44) 565.
- changes in, during baking, (42) 363.
- chemistry, (43) 609.
- club manual, (47) Ill. 696.
- dark, zinc content, (42) 758.
- determination in army rations, (41) 714.
- determination of volume, (48) 711.
- dough, viscosity as affected by electrolytes, (41) 169.
- doughs, H-ion concentration in, (50) 10.
- extra-yeast, nutritive value, (45) 566.
- fat determination in, (45) 13.
- from banana, dasheen, *etc.*, (41) 65.
- interim report, (50) 690.
- leavening experiments, (45) 464.
- making—

- and flour, (49) 660.
- chemical control, (45) 61.
- factors affecting, (44) U.S.D.A. 761.
- in France, (43) 261.

Bread—Continued.

making—continued.

- peanut flour as wheat supplement, (43) 764.
- studies, (46) Can. 162.
- treatise, (47) 261.
- use of apples and pears in, (43) 64.
- use of horse-chestnuts in, (43) 64.
- use of lupine seeds in, (42) 255.
- use of potatoes in, (42) 255.
- use of pumpkin in, (41) 558.
- mold in, (42) 162; (49) Wis. 660.
- nutritive value, (42) 457.
- pans, baking tests, (44) 662.
- protein, nutritive efficiency, (42) 459.
- ropy, bacteriology of, (43) 261.
- ropy, studies, (45) 663, 664.
- substitute for war bread in Germany, (43) 859.
- war, composition, (42) 552.
- war, use of wood in, (42) 363.
- wheat substitutes in, detection, (47) 806.
- whole wheat, nitrogen absorption, (44) 167.

Breadfruit—

- culture experiments, (48) Hawaii 338.
- Madagascar, description, (47) 129.
- ripe rot, control, (41) 841; (45) 443.

Breadstuffs, detection of milk in, (49) 611.

Breeding—*see also* Animal breeding and Plant breeding.

- experiments, correlation, (44) 766.
- experiments, correlation, criticism, (48) 661.
- of cattle, conference on, (48) 700.
- phenomena and dice casting, (47) 667.
- problems, applications of mathematics to, (41) 267.
- random, assortative, *etc.*, character distribution under, (41) 267, 268.
- self-fertilization and brother-and-sister mating contrasted, (41) 473.
- stock, scoring exhibits in, (50) 195.

Bremia lactucae, notes, (45) 748; (47) 351; (49) 45, 346; (50) 748.

Bremidae keys, (46) 463.

Bremus queens, confined, breeding experiments, (50) 259.

Bremus spp. as hosts of Psithyrus, (47) 856.

Brethesia—

- latifrons n.sp., description, (42) 656.
- new genus, erection, (42) 656.

Brevicoryne brassicae, *see* Cabbage aphid.

Brewers' dried grains—

- analyses, (41) Conn.State 176, Ind. 564, Can. 565, N.Y.State 868; (42) Mich. 63, 263, 560, Tex. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, Vt. 464, N.J. 672, R.I. 672, 867, Ind. 867; (44) Mass. 671, N.H. 671; (45) Tex. 68, N.Y.State 469, N.J. 774, 775, 872, R.I. 872, Vt. 872; (46) N.H. 675, Tex. 675; (47) Mass. 274, 275, Ind. 473, N.J. 570.

Brewers' dried grains—Continued.

composition and retail prices, Conn. State, (44) 176; (47) 570.

energy value, (47) 69.

feeding value, (41) Mass. 274.

Brewers' rice, feeding value, (50) Miss. 69.

Brewers' wet grains, analyses, (45) 872.

Brewing—

colloid chemistry in, (41) 310.

industry, handbook, (41) 417.

Brick cheese, ripening, bacteriological studies, (50) 280.

Brick—

disintegration as affected by alkali, (47) 591.

pavement construction, (44) 380.

pavements, impact tests, (46) U.S.D.A. 285.

pavements, monolithic, mileage tests, (42) 578.

pavements, standard specifications, (42) 891.

tests, (45) U.S.D.A. 488.

wall and roof construction, heat conductivity, (49) 188.

Bricks, sand-lime and cement concrete, (50) 88.

Bridge—

foundations, design, (44) U.S.D.A. 586.

laws in Kansas, (42) 483.

Skunk River, impact studies, (48) 782.

surveys, field manual, (42) 892.

Bridges—

analysis of impact on, (45) 290.

concrete, impact tests, (42) 485.

design, treatise, (44) 85.

economics of, treatise, (46) 286.

Federal control of, (43) U.S.D.A. 689.

highway, loads for, (41) 583.

highway, proposed loading for, (50) 186.

load concentrations on steel floor joists, (42) 579.

movable and long-span steel, treatise, (50) 387.

paints suitable for, list, (43) 284.

reinforced concrete, specifications, (42) 579.

steel, design and construction, (42) 486.

strengthening for motor truck traffic, (43) 186.

suspension, treatise, (48) 682.

toll, in New England, (42) 891.

Brilliant green, antiseptic value, (41) 188.

Brine, determination of bromid in, (47) 713.

Brines—

bromin in, (42) 9; (43) 13, 127.

iodin in (43) 13.

potash in, (43) 127.

potash, of Nebraska, (44) 724.

British—

Cotton Industry Research Association, (44) 829.

Goat Society, yearbook, (46) 874; (47) 868.

British—Continued.

National Institute of Agricultural Botany, (46) 398.

Rainfall Organization, transfer of work, (42) 499.

Broad-bean weevil, *see* *Bruchus rufimanus*.

Broccoli—

canning, (49) Oreg. 507.

culture and marketing, (44) Oreg. 833.

variety tests, (46) Del. 640.

Bromacetone, action on plants, (45) 28.

Bromocresol purple—

test for abnormal milk, (42) 209.

use as indicator, (47) 310.

Brome grass—

as forage crop, (44) Utah 525.

as hay crop, (48) N.Dak. 226.

awnless, breeding experiments, (50) Can. 433.

awnless, culture experiments, (48) Can. 450.

breeding experiments, N.Dak. (45) 225; (48) 30.

clones and sibs, studies, (46) N.Dak. 330.

culm formation in, (45) 825.

cultural directions, (45) N.Dak. 225.

culture, (44) Mont. 331, Alaska 523; (45) N.Dak. 734.

culture experiments, (41) Idaho 225, N.Dak. 822, N.Dak. 824; (43) Mont. 332; (44) N.Dak. 524; (45) U.S.D.A. 531; (46) U.S.D.A. 724; (49) Mont. 430, 735.

culture in British Columbia, (42) 733.

cutworm, summary, (44) 753.

duration in meadows, (50) N.Y.Cornell 231.

effect on following crop, (45) N.Dak. 226.

manuring experiments, N.Dak., (41) 139, 823.

physical characters, (46) N.Dak. 330.

seed, testing, (50) 740.

seeding experiments, (48) N.Dak. 224.

variety tests, (42) Minn. 824.

yields, (45) N.Dak. 225.

Bromid—

in brines and mineral waters, determination, (47) 713.

stannic, effect on soil permeability, (47) 20.

Bromin—

as seed disinfectant, (42) 146.

content of animal tissues, (44) 713; (45) 764.

determination, (43) 503.

determination in mineral waters, (42) 8; (43) 13.

determination in organic matter, (42) 711; (44) 713.

determination in urine, (45) 314.

figure of pulp, determination, (47) 207.

in Texas lakes, (43) 127.

Bromobenzol, effect on normal and rice-fed pigeons, (49) 766.

- Bromoxyleneol blue, use as indicator, (50) 311.
- Bromthymol blue, substitution for litmus. (47) 108.
- Bromus spp., analyses, (41) Wyo. 333.
- Bronchitis, verminous, of calves, (45) 887.
- Bronchopneumonia—
 bacillus associated with, (45) 384, 385.
 infectious, in horses, (45) 787.
 of swine, (44) 378; (47) 186.
- Brood coops and appliances, description, U.S.D.A. (42) 187; (44) 190.
- Brooder stove, hover for, (43) Wash. 189.
- Brooders—
 cost of heating, (47) Minn. 378.
 heating with hot water, (42) 187.
 methods of heating, (48) Calif. 573.
- Broom corn—
 culture, (47) N.Mex. 333.
 culture experiments, (43) U.S.D.A. 232; (49) Tex. 429, U.S.D.A. 630.
 dwarf, analyses, (45) 41.
 imported, European corn borer on, (43) 161.
 marketing, (47) U.S.D.A. 132.
 millet, effect on succeeding wheat crop, (41) N.Dak. 823.
 molds attacking, (45) Tex. 50.
 probable host of corn borer, (44) 451.
 returns from, in Georgia, (49) 90.
 rotation experiments, (42) 230.
 seed, composition and digestibility, Okla. (45) 373; (47) 171.
 seed for livestock, (43) 671.
 time of harvesting, (43) U.S.D.A. 233.
 variety tests, (43) U.S.D.A. 232; (49) Tex. 429, U.S.D.A. 630.
 yields, (42) Minn. 826; (46) Guam 726.
- Broom—
 millet ash, fertilizing value, (42) 526.
 millet red disease, notes, (45) 842.
 plant, historical account, (46) 532.
- Brosia meals, analyses, (42) 162.
- Brown coal—
 decomposition, determination of degree, (43) 213.
 humus, mixed with canal sewage as fertilizer, (45) 216.
 origin in middle Germany, (46) 219.
- Brown rot—
 fungi, studies, (49) 248.
 fungus, apothecia of, (50) Md. 842.
 of stone fruits, control, (50) Oreg. 842.
- Brown weevil, large, parasites and enemies, (49) 50.
- Brown-tail moth—
 blood cytology, (44) 758.
 caterpillar, blood infection, (44) 550.
 caterpillars, injury to silkworms, (42) 852.
 control, (41) Conn.State 158; (49) U.S.D.A. 852; (50) Conn.State 50.
 in Canada, paper on, (42) 748.
 in Nova Scotia, (46) 51.
 insect enemies, (43) 252.
- Brown-tail moth—Continued.
 notes, (43) Conn.State 251; (44) 351; (48) U.S.D.A. 52.
 parasite of, U.S.D.A., (41) 461; (47) 57; (48) 55.
 parasites of, distribution, (46) 457.
 pseudograsserie, (41) 358.
 suppressing, (45) Conn.State 148.
 vacuum fumigation experiments, (49) 654.
- Brucella melitensis—
 group, recent terminology, (50) 684.
 proposed term, (50) 183.
 serological classification, (50) 183.
- Brucella, new genus, studies, (46) 775; (47) 678.
- Brucella, proposed term, (43) 880.
- Bruchidae—
 and parasites in Hawaiian Islands, (43) 661.
 bionomics, (45) 658.
- Bruchobius laticeps, parasitism by, (42) Okla. 857.
- Bruchophagus funebris, *see* Clover seed chalcid.
- Bruchus—
 chinensis, *see* Cowpea weevil.
 obtectus, *see* Bean weevil.
 pisorum, *see* Pea weevil.
 quadrifasciatus—
 biology, (50) 850.
 control, (48) 749.
 life history and control, (42) Okla. 856.
 rufimanus—
 control, (41) 759.
 cooperative campaign against, (46) 159.
 studies, (42) U.S.D.A. 548.
- Brunchorstia destruens on pine, (50) 150.
- Brusone on Japanese medlar, remedy, (43) 349.
- Brussels sprouts—
 analyses, (43) 63.
 culture experiments, (49) Alaska 435.
 nutritive value, (41) 557.
 seed growing, (45) 44.
 variety tests, (43) 236.
- Bryobia praetiosa, *see* Clover mite.
- Bryophyllum—
 calycinum, cut stems, curvature, (49) 127.
 calycinum, regeneration, (41) 526, 727; (42) 26; (43) 821.
 physiological isolation, (42) 435; (45) 337.
 regeneration in, (44) 133; (46) 433.
- Bubble-counting technique for submerged plants, (49) 423.
- Bucculatrix—
 althaeae n.sp., description, (41) 257.
 canadensisella, notes, (41) Conn. State 159; (49) 50.
 thoracella, paper on, (44) 57.
 thurberiella, notes, (42) Ariz. 357; (43) U.S.D.A. 352.

Bucentes geniculata, life history, (44) 354.
Buckeye, red, toxic artion, Ala.Col. (44) 778; (47) 785.
Buckthorn survey, (48) Can. 450.
 Buckwheat—
 acid content, relation to soil acidity, (42) 424.
 analyses, (46) Can. 168.
 as affected by borax, (44) Me. 129.
 as affected by preceding crop, (41) R.I. 135.
 as chinch bug control crop, (49) Ill. 431.
 as green manure, (43) Md. 122.
 as nurse crop, (43) W.Va. 135.
 as silage crop, (41) 732.
 as wheat substitute, (44) U.S.D.A. 761.
 bran, analyses, (42) Mich. 63; (45) 872.
 culture, (43) U.S.D.A. 435; (44) Alaska 328, Alaska 522.
 culture and use, (41) U.S.D.A. 827.
 culture experiments, (41) N.Dak. 824; (43) Ind. 330, Ariz. 733; (47) Alaska 527; (49) Alaska 426.
 culture on sandy soils, (41) Wis. 18.
 decomposition rate in soil, (46) N.Y. Cornell 212.
 digestibility coefficients, (48) 574.
 early growth in alkali soil, (42) Utah 28.
 effect of—
 number of plants per hill, (41) N.J. 36.
 position of grain, (41) N.J. 36.
 soil disinfection, (42) 717.
 temperature range, (50) 20.
 effect on following crop, R.I. (41) 135; (44) 33.
 effect on oxidation in soil, (47) 213.
 effect on soil acidity, (47) 723.
 enzyme content, (42) 228.
 feed, analyses, (42) 263; (43) N.J. 69, N.J. 672; (45) N.J. 774; (47) 275, N.J. 570.
 fertilizer experiments, (41) N.J. 22, N.J. 23, R.I. 135, 326; (43) W.Va. 135; (44) 421; (45) Ill. 121.
 flour, characteristics and detection, (41) 467.
 germination as affected by organic substances, (41) 523.
 germination, fertilizer injury to, (50) N.J. 216.
 grading, tentative rules, (47) 825.
 growth and composition as affected by length of day, (49) 739.
 growth in artificial light, (48) 26.
 growth, relation to seed weight, (50) 134.
 hulls and middlings, analyses, (41) Ind. 868.
 hulls, digestion coefficients, (42) 263.

Buckwheat—Continued.

 middlings, analyses, (41) N.Y.State 868; (42) 263; (43) N.J. 69, N.J. 672, 867; (45) N.J. 774; (47) 275, N.J. 570.
 middlings and hulls, analyses, (46) Mich. 168.
 middlings v. gluten feed, (47) Pa. 478.
 mixed feed, analyses, (41) Ind. 564; (45) N.Y.State 469.
 nickel and cobalt in, (49) 520.
 notes, (47) Alaska 527.
 nutrient requirements, (43) Md. 121.
 nutritive value, (50) 160.
 offal, analyses, N.J. (43) 69, 672; (45) 774; (47) 570.
 production in United States, (49) U.S.D.A. 389.
 products, analyses, (47) N.Y.State 172.
 proteins of, (47) 502.
 region, beekeeping in, (47) U.S.D.A. 57.
 relation of potassium to growth, (43) N.H. 29.
 response to fertilizers, (48) R.I. 518.
 roots, effect on decay of organic matter in soil, (41) N.J. 28.
 rotation experiments, (42) 230.
 screenings, feeding value, (41) 569.
 seed production, (48) N.Dak. 225.
 seeding depths and rates, (41) N.J. 36.
 seeding experiments, (43) W.Va. 135.
 seedlings, availability of phosphates for, (41) N.J. -7.
 shorts, analyses, (42) 560.
 silage, palatability tests, (45) 375.
 sodium for, (41) R.I. 426.
 starch, microphotograph of, (48) 708.
 Tartary, variation in, (44) Me. 135.
 use of soil potassium by, (43) 218.
 utilization of phosphates by, (45) 217.
 varieties, (41) Alaska 30, Alaska 31, Idaho 226; (46) Mich. 633.
 varieties for Canada, (47) 823.
 variety tests, (43) W.Va. 135; (44) Alaska 523; (45) Can. 822; (46) Mont. 327; (49) Can. 734; (50) Can. 533.
 yield cycles, (41) 892.
 yields in New Jersey, (46) 225.
 young and mature, salt requirements, (41) N.J. 27.
 Bud—
 development, periodicity of, (49) 127.
 formation in maple, (42) 130.
 formation of plant hypocotyls, (41) 818.
 moth, molting studies, (47) 852.
 moths, notes, (46) 749.
 moths on apple, studies, (41) 61.
 mutation in citrus, (50) 822.
 rot on coconut, notes, (42) 50.
 symbiosis in *Ardisia crista*, (42) 333.
 variation as asset in horticulture, (41) 236.

Bud—Continued.

- variation in plants, experiment station research in, (49) 104.
- weevils, notes, (44) Oreg. 850.
- worm infestation v. pulpwood production, (49) 452.
- worm injurious to apple trees, (46) Ky. 157.
- worm, structure of larvae, (44) Ky. 550.

Buddleia globosa, propagating in acid medium, (49) 836.

Budget planning in social case work, (41) 669.

Buffalo—

- grass, dioecious nature, (43) 522.
- hides, trade in India, (44) 573.
- malarial parasite in blood of, (42) 381, 679.
- milk, analyses, (48) 274.
- milk, cheese from, (41) 680.
- treehopper—
 - control, (41) Kans. 41.
 - in South Dakota, (41) 58.
 - notes, (46) Mich. 457.

Buffalo-berry of North Dakota, (41) 836.

Buffaloes—

- as dairy stock in India, (41) 777.
- as virus producers for antirinderpest serum, (47) 385.
- breeding experiments, (50) 275.
- National herds, (41) 772.
- Syngamus laryngeus* in, (43) 688.

Buffer—

- indices of culture media, (48) 203.
- solution for colorimetric comparison, (46) 804.

Bugs, swarming fulgorid, notes, (45) 658.

Builders' handbook, (46) 691.

Building—

- construction, handbook, (45) 394.
- construction, types, heat loss through, (46) 691.
- estimator's reference book, (43) 188.
- material standards, (46) 285.
- materials, acoustic properties, (47) 191.
- materials, heat conductivity, (46) 86.
- materials, properties, (46) 891.
- stones of Kentucky, (50) 686.

Buildings, small, concrete construction, (43) 188.

Bulb—

- connecting, description, (42) 802.
- fly, lesser, notes, (48) 855.
- mite, anatomy, notes, (42) 656.
- mite, notes, (48) 256.
- mite, studies, (44) Conn.State 857.

Bulbs—

- and bulb bloom, (46) Can. 235.
- culture and propagation, treatise, (47) 239.
- culture, methods, (42) U.S.D.A. 346.
- for Nebraska, list, (43) 240.
- hardy, in New Zealand, (42) 523.

Bulbs—Continued.

- imported, inspection, (43) Conn.State 251.
- relation to nematodes, (50) 452.

Bulls—see also Sires.

- as carrier of abortion, (50) West.Wash. 184.
- costs and returns, (47) N.Y.Cornell 578.
- effect of exercise and feed on vitality, (45) Wash. 275.
- effect on milk yield of daughters, (45) 72.
- fertility and sterility in, (49) 178.
- genital infections in, (46) 882; (47) 80.
- in treadmill, power developed, (44) Mont. 785.
- judging, (47) West.Wash. 581.
- power from, (49) Mont. 184.
- purebred, on forest ranges, (45) 469.
- vitality and breeding ability, factors affecting, (49) Wash.Col. 275.

Bulrush—

- composition and digestibility, (45) 168.
- leaf miner, life history, (49) N.Y.Cornell 854.

Bumblebees—

- interrelation with *Psithyrus*, (50) 153.
- of central Europe, classification, (43) 851.
- of District of Columbia, (44) 167.
- of Illinois, keys, (46) 463.
- rôle in pollination, (46) 840.

Bunostomum—

- phlebotomum, notes, (46) La. 281.
- trigonocephalum, free-living larval stages, (49) 499; (50) 253.
- trigonocephalum in sheep, (46) 685.
- trigonocephalum, notes, (47) Okla. 85.

Bunt, *see* Wheat smut, stinking.

Bupalus piniarius—

- gradation, effect of station and climate, (50) 255.
- notes, (41) 455; (44) 250. 754.

Buprestidae, little known, collecting, (43) 57.

Buprestids on blackberry, biology, (49), 848.

Bureau of—

- Animal Industry, Pennsylvania, scope and policy, (43) 780.
- Chemistry, color laboratory, problems, (43) 14.
- Chemistry, organization and function, (44) U.S.D.A. 501.
- Crop Estimates, statistical data, (44) U.S.D.A. 693.
- Economics and Social Intelligence, publications, (46) 590.
- Education, Federal, relation to State universities and colleges, (49) 491.
- Farm Management and Farm Economics, U.S.D.A. (41) 292, 386.
- Home Economics, plan, (49) 596.

Bureau of—Continued.

- Markets, produce inspection service, (42) 492.
- Markets, relation to potato industry, (45) 40.
- Public Roads, history, (45) U.S.D.A. 790.
- Public Roads, relations to States, (43) U.S.D.A. 387.
- Soils and Reclamation Service, cooperation, (49) 616.

Burette—

- new gasometric, description, (42) 109.
- weighing, description, (41) 311.

Burgundy mixture—

- adhesiveness, (43) N.H. 842.
- and Pickering sprays, comparison, (43) U.S.D.A. 843.
- chemistry of, (42) 205.
- fungicidal value, (41) 845; (42) 48; (43) 544.
- preparation, (42) 146.
- preparation and use, (41) 250; (43) 155.
- sugar in, (47) 242.
- tests, (45) 146.
- treatment to develop copper stearate, (41) 841.

- v. Bordeaux mixture, (47) N.H. 448.

Burkheiser salt, fertilizing value, (49) 20.

Burns, treatment, (41) 83.

Burro weed, poisonous to livestock, (45) Ariz. 479.

Bush hay, analyses and digestibility, (45) 468.

Bush sickness, treatment, (41) 281.

Busseola fusca in Africa, (45) 554.

Bustomum—

- phlebotomum extracts, experiments, (46) 379.
- spp., effect on coagulation of blood, (45) 477.

Butanol from fermentation of corn, (50) 12.

Butt rot, studies, (48) 850.

Butter—

- acidity, (49) 176.
- adulterated and misbranded, (41) N.Dak. 66.
- adulteration, detection, (42) 162, 315; (43) 315; (46) 13, 14; (48) 13; (49) 311.
- amino nitrogen and ammonia in, (48) 206.
- analysis, methods, (43) Ind. 805; (44) 677.
- and cod liver oil, vitamin A in, (45) 564.
- and ghee, comparison and analyses, (47) 582.
- antirachitic properties, (50) 771.
- as carrier of disease, (50) 878.
- Babcock method for determining fat in, modified, (44) N.Y.Cornell 873.
- bacterial content, (48) 176.
- bacteriological and biochemical studies, (44) 873.

Butter—Continued.

- box material, (47) Calif. 676.
- boxes, woods for, (50) Calif. 782.
- cacao butter in, detection, (47) 14.
- caramel flavor, cause, (47) Iowa 382.
- chemistry of churning, (41) Mo. 680.
- classification, (48) 773.
- cold storage reports, (41) U.S.D.A. 66.
- color defects in, (43) 380.
- control scheme in Ireland, (46) 772.
- creamery, production during the war, (41) 473.
- Crismer number, (42) 315.
- curd and fat determination in, (48) 807.
- deterioration, caused by *Oidium lactis*, (42) 674.
- effect of grade of cream, (49) Okla. 475.
- effect of temperature of cream, (49) 74.
- enzymes, relation to tallowiness, (44) 273.
- examination for microorganisms, (45) 277.
- export trade of Denmark, (42) U.S.D.A. 378.
- fat, *see* Fat and Milk fat.
- faulty flavors, causes and remedies, (44) 372.
- faulty flavors in, (42) Wis. 377; (45) Mich. 476.
- fishy flavor in, (42) 565; (43) N.Y.Cornell 470; (44) 75; (49) 74, 176, 679; (50) Wis. 279.
- flavor and keeping quality, Iowa (47) 784; (48) 377.
- flavor, effect of metallic lactates, (47) 282.
- flavor in, sources, (47) Iowa 382.
- flour for infant feeding, (42) 255; (43) 567.
- from pasteurized cream, (49) 700.
- from whey cream, (46) 772.
- from whey, quality, (47) Wis. 481.
- garlic flavor removal, (43) 879.
- Hortvet test, (44) 311.
- household foam test, (42) 162.
- hydrometer, (45) 315.
- imports and exports, (43) 74.
- imports into Great Britain, (46) 276.
- imports into United Kingdom, statistics, (42) 774.
- imports, significance, (44) U.S.D.A. 389.
- incorporation of proteins in, (44) 677.
- industry in New South Wales, statistics, (42) 774.
- industry in United States and other countries, (42) U.S.D.A. 377.
- international trade, (46) 675.
- keeping qualities and flavor, (42) Minn. 876.
- keeping quality, effect of microorganisms, (50) 476.
- laboratory guide, (45) 697.

Butter—Continued.

- leaky, cause, (42) Wis. 377; (43) 682; (48) 276.
- lecithin content, (42) N.Y.Cornell 564.
- legal standards for, (42) 473.
- making, (43) 580; (44) 796.
- making—
 - bacteriological background, (49) Mich. 878.
 - better cream for, (50) Ind. 179.
 - commercial, treatise, (45) 277.
 - demonstrations at Salisbury, (47) 380.
 - experiments, (46) 275.
 - in Denmark, (47) 282.
 - manual, (46) 275.
 - neutralized cream in, (43) 75.
 - neutralizing cream for, (45) 880; (50) N.Y.Cornell 76.
 - on the farm, (42) U.S.D.A. 396; (46) 772; (47) Ariz. 282; (48) 276.
 - partial neutralization of cream, (47) 79.
 - plants, plans and equipment, (41) 184.
 - principles and practice, treatise, (48) 80.
 - pure culture starter for, (45) 73.
 - role of bacteria in, (42) 564.
 - studies, (50) 782.
 - treatise, (41) 592; (42) 269; (43) 779.
- marketing, efficient, (46) 594.
- moisture determination in, (42) 210; (49) 113.
- molded, (45) 381.
- mottled, cause and prevention, (43) 779.
- neutralizers in, detection, (44) 12.
- nutritive value, effect of heat and oxygen, (45) 564.
- pasteurized, significance of yeasts and *Oidia* in, (47) 784.
- phosphorus in, (43) N.Y.Cornell 469.
- pickling, (42) Calif. 876.
- preservation in brine, (44) Calif. 777.
- preservation method, (43) 682.
- production and prices, statistics, (43) 74.
- production and trade, (49) 376.
- quality, defects in, (48) U.S.D.A. 80.
- quality, factors affecting, (46) 680.
- quality, relation to amino and ammonia nitrogen in, (50) 476.
- rancidity, (46) 109.
- records, methods of keeping, (48) 478.
- retail, grade claimed and actual grade, (46) 177.
- salt determination in, (48) 712; (49) 113.
- soluble nitrogen compounds in, (50) 805.
- soup feeding of infants, (48) 655.
- stored, variations in bacterial content, (49) 176.

Butter—Continued.

- sweet cream, (41) 375.
- test, Farrington, (48) 480.
- testing, (48) 275.
- trade, since 1913, (44) U.S.D.A. 894.
- treatise, (45) 801; (50) 679.
- unsalted, mold on, (44) Conn.State 149.
- v. cod liver oil, effect on deposition of calcium in bones, (47) 861.
- Valento test and Crismer number, (41) 805.
- vitamin A content, (46) 357, 680.
- whey, *see* Whey butter.
- workmanship, (48) 578.
- yeasts and molds in, (42) 674; (44) 874; (48) 80.
- yield, computation of, (42) 269.
- Buttercup poisonous to livestock, (47) Nev. 786.
- Butterflies—
 - and moths, treatise, (50) 257.
 - common, leaflet, (46) 247.
 - Indian, notes, (45) 657.
- Butterfly, swallowtail, injurious to orange trees, (47) 553.
- Buttermilk—
 - as protein supplement for pigs, (49) Mich. 469.
 - as source of minerals for poultry, (49) 674.
 - as source of protein for egg production, (47) 871.
 - cheese, manufacture and marketing, (44) Wis. 75.
 - cheese, preparation, (41) 81.
 - commercial, (45) 381.
 - condensed, analyses, (46) Tex. 675.
 - condensed, feeding value, (50) Wash. Col. 277.
 - dried, analyses, Ind. (41) 564; (43) 867; (47) 473.
 - dried, as source of protein for hens, (49) Idaho 777.
 - dried, digestibility coefficients, (48) 574.
 - dried, feeding value, (50) Tex. 70.
 - dried, for pigs, (44) 674.
 - dried or condensed, use, (48) 773.
 - fat determination in, (50) 10.
 - fat in, effect of acidity of cream, (47) 79.
 - feeding value, (41) Mich. 74, 569; (46) Ind. 574; (49) 273; (50) Can. 370.
 - for hog feeding, pasteurization, (48) 176.
 - for poultry, (41) N.J. 76, Ind. 570.
 - fresh v. dried for poultry, (49) Iowa 777.
 - lemonade, preparation, directions, (42) U.S.D.A. 363.
 - neutralizers in, detection, (44) 12.
 - phosphorus in, (43) N.Y.Cornell 470.
 - powder, feeding value, (41) Iowa 273.

Buttermilk—Continued.

- preparation, directions, (42) U.S.D.A. 363.
- products, feeding value, (48) N.J. 372.
- semisolid, analyses, (45) 872, R.I. 872; (48) Can. 368.
- semisolid, feeding value, (41) 675; (49) Can. 70, Ky. 574.
- semisolid, feeding value as corn supplement, (42) Kans. 374.
- semisolid, v. tankage for hogs, (45) Nebr. 171.
- testing, (46) 680.
- utilization, (41) 80.
- v. tankage for fattening pigs, (43) Mo. 772.
- value for egg production, (50) 273.

Butternut—

- bark disease, notes, (41) 752.
- curculio, life history, (47) U.S.D.A. 556.

Butternut-Japan-walnut hybrids, (41) 447.

- Butternuts, vitamin A in, (44) 765.

Butyl alcohol—

- for quantitative saponification, (43) 505.
- formation, (44) 309.
- production process, (41) 415; (42) 708; (43) 712.

N-Butyl alcohol manufacture, bacteriology of, (46) 617.

Butyric—

- acid, effect on molds, (45) 463.
- fermentation of corn, gases from, (50) 12.

Byctiscus betulae in Rhine Province, paper on, (42) 152.

Bynin and hordein, identity, (42) 411.

Byturus—

- tomentosus, spraying for, (46) 461.
- unicolor, notes, (50) 51.
- unicolor, studies, (50) 848.

Cabbage—

- and kale hybrids, (50) 633.
- antiscorbutic value, (41) 167, 168.
- aphids—
 - control, (43) N.Mex. 352; (44) Va.Truck 159; (47) 52; (48) U.S.D.A. 457; (49) N.C. 757.
 - extermination, (49) 555.
 - in New Jersey, (41) N.J. 255.
 - nicotin sulphate dust for, (44) U.S.D.A. 652.
 - notes, (45) V.I. 150; (46) 51; (49) N.Mex. 554.
- as affected by dolomagnesium, (44) 423.
- as affected by potash and kainit, (44) 515.
- as vitamin source for chicks, (46) Kans. 478.
- bacterial black rot, studies, (43) 751.
- black rot—
 - control, (45) Wis. 242.
 - notes, (43) 151; (48) 842.
 - organism, tolerance to acids, (46) 740; (48) 644.

Cabbage—Continued.

- black rot—continued.
 - seed disinfection, (44) Wis. 241.
 - seed transmission, (45) 542.
 - seed transmission and overwintering, (47) 350.
- blackleg—
 - control, (43) 46; (47) U.S.D.A. 149; (48) 158.
 - hot water seed treatment, (42) 245.
 - notes, (42) N.Y.State 349; (43) 151, 654; (44) Conn.State 150; (44) 842, 843; (48) N.J. 345; (50) 650.
 - seed disinfection, (44) Wis. 241.
 - seed infection, (42) Wis. 350.
 - studies, (46) Iowa, 342.
- breeding experiments, (43) Md. 144, Pa. 537; (44) 632, Pa. 740; (46) Del. 639; (47) Pa. 437; (48) 442, Del. 635.
- butterfly, blood cytology, (44) 758.
- butterfly in Switzerland, (42) 152.
- butterfly, southern, notes, (45) V.I. 150.
- canning, temperature changes in, (45) U.S.D.A. 560.
- carbohydrate content, (42) 202.
- carbohydrates, availability, (42) 457.
- Chinese—
 - black rot, notes, (45) 446.
 - culture, (44) Alaska 532.
 - disease, (48) 146.
 - mosaic disease, (46) 148.
 - self-sterility in, (49) 137.
 - soft rot, (44) Conn.State 150.
- clubroot, control, (45) 50; (46) Va. 648; (47) Pa. 445; (48) 827.
- clubroot, notes, (43) 244; (44) 49; (45) 842; (47) 44; (49) 44.
- clubroot, soil temperature and moisture relations, (47) Wis. 446.
- cost of production, (45) Ohio 134; (46) Miss. 590.
- culture, (41) N.Mex. 237; (43) Pa. 536; (44) 632, Alaska 532; (47) Alaska 535; (48) Minn. 338, V.I. 340; (49) Alaska 435.
- culture for sauerkraut, (41) 807.
- culture on peat soil, (46) 216.
- dehydrated, bacteria and molds in, (48) 60.
- digestibility in stomach, (42) 862.
- disease in Rio Grande Valley, (49) Tex. 442.
- disease resistant varieties, (43) Md. 144.
- diseases, notes, (44) 748; (45) 47, 649, 842, 843.
- diseases, popular descriptions, (50) U.S.D.A. 45.
- dusting for worms, (49) N.C. 757.
- effect of phosphatic fertilizers, (49) 726.
- effect of preceding crop, (46) R.I. 233, 336.

Cabbage—Continued.

effect of soil acids on, (42) Wis. 324.
 fertilizer experiments, (41) Mass. 21;
 (42) 22, 223; (44) R.I. 21; (47)
 Wash. 124, 322, R.I. 419, N.Mex.
 437, Pa. 438, R.I. 725; (48) N.J.
 340; (49) Ohio 337, N.Mex. 532.
 fertilizer experiments with goat
 manure, (49) N.Mex. 517.
 flea-beetle, control, (44) U.S.D.A. 257;
 (49) 252.
 fly, studies, (41) 358.
 following different crops, (44) R.I. 33.
 foot rot, control, (46) 543.
 Fusarium resistant, (44) Wis. 643,
 748.
 Fusarium wilt, notes, (47) Calif. 646.
 green Baris in France, (44) 657.
 hardening process in, (46) Mo. 827.
 hardness, varietal differences, (46)
 838.
 heart rot, notes, (46) 741.
 inheritance of head and root forma-
 tion, (45) 345.
 insects, studies, (50) N.Y.State 555.
 irrigation experiments, (46) Mich.
 537; (49) N.Mex. 532.
 juice, vitamin C as affected by heat,
 (43) 567.
 leaves, decay in storage, (42)
 N.Y.State 350.
 leaves, dried, feeding value, (42)
 369.
 leaves, 3-carbon sugar from, (50)
 309.
 lightning injury, (48) 543.
 looper, control, (41) 662; (44)
 Va.Truck 159; (47) Va.Truck 236.
 looper, parasites, (41) 854.
 maggot—
 control, (42) 548; (43) Can. 759,
 850; (45) 454, 557, 761; (46)
 51, 248; (47) Ind. 156, Mich.
 162, 257, N.J. 258, 361, 362,
 757; (48) 157, N.Y.Cornell
 752, 855; (49) 50, Pa. 251,
 N.H. 351, 557.
 experiments, (50) Conn.State 50.
 in Ontario, summary, (49) 558.
 in seed beds, control, (50)
 N.Y.State 555.
 life history studies, (50) Pa. 454.
 notes, (41) 755; (46) 51; (48)
 852.
 paper on, (47) 756.
 rearing on agar jelly, (45) 858.
 studies, (41) 358; (42) 52.
 summary, (47) Idaho 258.
 surface treatment, (49) N.H. 853.
 mosaic disease, (44) 748; (45) 446.
 mulching experiments, (49) Ohio 337.
 notes, (49) R.I. 533.
 on moor soils, potash for, (41) 519.
 on partially sterilized soils, (41) 515.
 overhead irrigation studies, (50)
 Minn. 139.

Cabbage—Continued.

phosphorus requirements, (44) R.I. 32.
 pollination, studies, (48) 636.
 preparation for drying, (45) 416.
 production, (50) Calif. 741.
 propagating soil for, (47) Pa. 438.
 red and white, edible portion and
 waste, analyses, (43) 63.
 red, nutritive value, (41) 557.
 root development, (43) 834.
 seed growing, (45) 44.
 seed stalk weevil, studies, (46) 354.
 seed treatment, (41) Iowa 246.
 seed, treatment with hot water, (42)
 245.
 seedlings, soil mixtures for, (50) Pa.
 440.
 self-compatibility test, (48) Del. 635.
 sodium for, (41) R.I. 426.
 soft rot, notes, (48) 242.
 solidity of head, factors affecting, (50)
 Pa. 439.
 stem rot, control, (48) Del. 46.
 storage cellar, Bordeaux dust for,
 (50) Can. 339.
 storage experiments, (43) N.H. 36;
 (44) Mont. 337.
 strain tests, (47) Va.Truck 535.
 sun-dried, vitamin content, (43) 63;
 (46) 359.
 tissue breakdown in, (47) 248.
 varieties, (43) Pa. 536; (49)
 U.S.D.A. 636.
 variety tests, (42) Minn. 835; (44)
 632; (45) N.Dak. 235.
 vitamin A extraction from, (44) 261.
 vitamin A in, (43) 165.
 vitamin B and C in, (43) 63.
 vitamin B in, effect of cooking, (44)
 562.
 vitamin C in, effect of cooking, (47)
 466; (49) 563.
 vitamin C in, preservation by drying,
 (45) 61.
 vitamin in, (42) 556, 759.
 vitamin in, effect of cooking, (49)
 663.
 wilt, control, (48) Del. 46.
 worms—
 control, (41) 662; (43) N.C. 449;
 (49) Wis. 653.
 imported, control, (44) 159; (47)
 Va.Truck 236; (48) 52.
 imported, notes, (48) Hawaii 355.
 in South Dakota, (43) 850.
 in Wisconsin, (42) 156.
 notes, (41) U.S.D.A. 462.
 yellows—
 breeding for resistance, (47)
 Wis. 446.
 control, (42) Wis. 350; (46) Va.
 648.
 description, (47) 840.
 in seedlings, effect of soil tem-
 perature and moisture (49)
 542.

Cabbage—Continued.

yellows—continued.

- notes, (43) 151; (44) Iowa 444; (45) Wis. 243; (46) 543.
- relation to soil conditions, (44) 643.
- resistant strains, (41) 450; (46) Iowa 344; (47) 350, Iowa 749; (49) Iowa 747, Wis. 644.
- resistant varieties, (44) Wis. 241.
- studies, (43) Ind. 345; (46) Iowa 342.
- yields, (41) Idaho 226.

Cables—

- efficiency tests, (42) 388.
- in soils, heating, bibliography, (48) 618.

Cacao—

- bean flour, characteristics and detection, (41) 467.
- beans, culture and expression of oil, (43) 240.
- beans, theobromin in, (47) 807.
- black rot, (46) 44.
- breeding experiments, (49) 735.
- brown pod, (42) 353, 541.
- brown rot, notes, (42) 145.
- budding and grafting, (42) 640.
- butter, adulteration, (50) 205, 805.
- butter analysis, method, (49) 611.
- butter detection in butter, (47) 14.
- coconut bud rot on, (43) 156.
- cryptogamic diseases, (45) 653; (49) 539.
- culture, (41) 242, 740; (42) 43, 443; (45) 140; (50) 637.
- culture in Colombia, (46) 391.
- culture in French colonies, papers on, (43) 342.
- die-back, notes, (46) 845.
- disease in Ecuador, (46) 149.
- disease, studies, (42) 49.
- diseases, (44) 49, 750; (50) 42.
- diseases in Trinidad, (50) 354.
- in Panama, frog hopper affecting, (49) 450.
- in Tropics, (42) 599.
- industry in Brazil, (42) 640.
- insects affecting, (41) 59, 455; (42) 451; (43) 52; (45) 656; (47) 551; (49) 654.
- origin and flowering habit, (50) 343.
- pests in Grenada, (42) 52.
- phytophthora disease, (41) 55.
- plantations, termites of, (48) 252.
- pod and bean disease, (45) 541.
- pod rot and coconut bud rot, comparison, (46) 453.
- Pods, Monilia disease of, (44) 247.
- production in Brazil, (43) 292.
- production in West Indies, (45) 33.
- products, analysis, (44) 9.
- products, fat determination in, (50) 196.
- products, rice moth on, (41) U.S.D.A. 459.

Cacao—Continued.

- products, shells in, (47) 312, 313.
 - renewal, (47) 50.
 - root disease, control, (44) 649.
 - root diseases, notes, (42) 350.
 - root fungi, (47) 50.
 - rot, studies, (42) 643.
 - sanitation as related to disease protection, (42) 542.
 - selection experiments, (41) 741.
 - shading with bois immortel, (41) 213.
 - shells, analyses, (41) Can. 565.
 - thrips—
 - control in Trinidad, (42) 357.
 - in Grenada, (41) 59.
 - in Porto Rico, (49) 555.
 - studies, (45) 550; (47) 54.
 - tree diseases, notes, (48) 45.
 - trees, sunstroke, (45) 653.
 - trees, yields, (44) P.R. 442.
 - variety tests, (45) 140.
 - white thread, notes, (42) 145, 350, 541.
 - witches' broom, notes, (41) 841; (45) 443.
- Cachaza—
- fertilizing value, (49) 23.
 - fertilizing value and analyses, (42) 223.
 - value from run-down soils, (49) 513.
- Cacoecia—
- argyrophila, *see* Fruit tree leaf roller.
 - franciscana, life history, (46) 56.
 - fumiferana, notes, (50) 756.
 - hewittana n.sp., description, (44) 656.
 - parallela, life history notes, (50) Mass. 659.
 - rosaceana, studies, (41) 61.
- Cactaceae, perennation and proliferation of fruits, (43) 328.
- Cactus—*see also* Opuntia.
- carbohydrate economy, (41) 28.
 - carbohydrates, nature of, (44) 426.
 - culture and propagation, (49) 836.
 - distribution, cold resistance as factor, (45) 429.
 - giant, analyses of seed, (48) Calif. 506.
 - musilage formation in, (43) 132, 226.
 - prickly pear—
 - as stock feed, (43) U.S.D.A. 35; (45) 69; (48) 568, 570; (50) 774.
 - dissemination and eradication, (50) 639.
 - fungus disease, (41) 248.
 - high temperature record, (45) 526, 731.
 - in Australia, (41) 735.
 - insects affecting, (46) 656.
 - oil, analyses, (44) 802.
 - seeds, germination tests, (46) 33.
 - sugar content and seed oil, (45) 612.
 - uses, (45) 416.

Cactus—Continued.

- root growth as affected by soil environment, (41) 132, 134.
- spineless, feeding value, (42) Calif. 868.
- stability of spineless character, (43) U.S.D.A. 35.

Caddis-fly larvae, biology, (45) 659.

Cadelle—

- biology, (50) 457.
- control, (47) Calif. 654.
- in Australian wheat, (41) 759.
- larval stage, longevity, (47) 855.

Cadios, culture directions, (45) 35.

Cadmium—

- chlorid in diet, chronic intoxication by, (49) 258.
- pharmacological action, (42) 175.

Caecoma strobilina, studies, (42) 248.

Caesium in Hagerstown soil, (49) Pa. 210, 617.

Cafeteria—

- establishment, (48) 160.
- for hotel employees, (42) 458.
- operation in an industrial plant, (43) 663; (48) 160.

Caffein—

- and theobromin, distinguishing, (41) 714.
- determination, (41) 412, 799; (43) 804.
- distribution between water and chloroform, (47) 15.
- effect on catalase production, (42) 259.
- from *Ilex vomitoria*, (41) 409.
- in coffee, determination, (47) 313.
- in tea, determination, (47) Conn.State 559.

Cajanus indicus—

- culture in Ceylon, (41) 529.
- notes, (44) 445, 446.

Cake—

- acid response of stomach and evacuation time, (44) 665.
- and corn feeding on rotation plats, (41) 826.
- baking, optimum temperature, (44) 662.
- baking temperature, (45) Mo. 261.
- feeds, rancidity, (41) 10.
- fertilizers, bacterial transformation, (41) 816.

Calamagrostis—

- canadensis, notes, (47) Iowa 542.
- langsдорfi as hay and silage crop, (41) Alaska 30.

Calceolaria spp., propagating in acid medium, (49) 836.

Calcicoly, problem, (47) 526.

Calcite, fertilizing value, on acid soils, (42) 330.

Calcium—

- absorption by plants, (45) 29; (50) 524.
- absorption by wheat seedlings, (41) 27.

Calcium—Continued.

- absorption in children on low fat diet, (49) 457.
- adsorption, relation to soil reaction, (50) 512.

alimentary absorption and deposition in tuberculosis, (49) 379.

ammonium nitrate, fertilizing value, (49) 623.

and magnesium metabolism, interrelations, (48) 755.

and nitrogen relation in plants, (50) 524.

and phosphorus metabolism in children, (48) 463.

and sodium, pseudoantagonism in dilute solutions, (49) 730.

and vitamin A deficient diet, effect on rats, (47) 567.

arsenate—

- analyses, (44) N.J. 440.
- and arsenite, composition and use, (41) Can. 549.

as bait for slugs, (44) Oreg. 158.

available supply in United States, (50) 554.

cause of injury from, (42) Mich. 355.

chemical changes during storage, (48) U.S.D.A. 309.

determination of arsenic oxid in, (41) 799.

dust, insecticidal value, (49) 759.

effect on cotton boll weevil, (47) U.S.D.A. 163.

for poison bait, (41) 252.

injury to foliage, (48) Mass. 346.

insecticidal value, (41) Ill. 146, 160, Wis. 661; (43) Colo. 158, Oreg. 756; (46) Mich. 443; (47) Va.Truck 236.

properties, (49) U.S.D.A. 448.

relation to boll weevil control, (50) 851.

solubility in carbon dioxid, (41) 799.

studies, (42) Mass. 356.

use, (47) 53.

use on cotton, (50) U.S.D.A. 259.

use on potatoes, (44) Mich. 144.

arsenite, preparation and application, (46) 613.

arsenite, studies, (42) Mass. 356.

as affected by nitrification and sulfonation, (46) Ohio 430.

as limiting factor for milk secretion, (47) 279.

assimilation—

- as affected by cod liver oil, (46) 566.
- as affected by vitamin, (47) Wis. 479; (49) 167.

dietary factors in, (50) 678.

effect of alfalfa, (47) 875.

effect of dry v. fresh green plant tissue, (44) 64; (46) 566.

Calcium—Continued.

assimilation—continued.

effect of rations, (48) 477.

effect of yeast and butter fat, (48) 756.

factors causing, (49) 675; (50) 277.

balance of dairy cows, (49) 779.

carbide as source of alcohol, (43) 618; (50) 287.

carbonate—

as feed supplement, (44) Ohio 175.

as soil solvent, (47) 512.

determination in soil, (47) 18.

carbonate, effect on—

acid soil nutrients, (47) 518.

aluminum salts, (44) 125; (47) 122.

availability of soil potash, (43) Md. 121.

barley, (44) 512.

biochemical processes of soil, (46) 714.

composition of soil extracts, (43) Mich. 124.

nitrification in soils, (43) Tex. 725.

nitrification of cottonseed meal, (47) Tex. 217.

seed germination, (41) 523.

solubility of phosphates, (45) 217.

sulfonation, (46) Ohio 429.

wood distillation, (47) 208.

carbonate—

fertilizing value, (44) 24; (47) 512.

reaction with phosphates, (41) 720.

relation to soil solution, (49) 518.

transformation in soil, (45) 25.

use in nitrogen fixation experiments, (49) 515.

use on moor soils, (42) 624.

caseinate—

and lime sulphur, fungicidal value, (50) 346.

as spray spreading agent, (49) 51, Oreg. 549, Mont. 853.

insecticidal value, (49) 760.

chlorid—

effect on experimental botulism, (49) 667.

effect on soil permeability, (47) 20.

effect on starch, (47) 128.

hygroscopic power, (48) N.J., 353.

ions, absorption by peas and corn, (48) 726.

role in concrete hardening, (42) 582.

use as protection against freezing of concrete, (49) 385.

use in concrete road construction, (47) 188.

use in conserving ammonia, (42) 22.

Calcium—Continued.

chlorid—continued.

use in fixing ammonia, (43) 628.

use to prevent nitrogen loss from manure, (44) 817.

compounds, effect on crop yield and calcium content, (48) 721.

compounds, effect on plant growth, (46) Ky. 816.

compounds on adobe soils, use, (46) 521.

concentration in blood, effect of sunlight, (50) 63.

concentration in blood serum, (48) 564.

cyanamid—

ammonia production from, (41) 219.

ammonium sulphate from, (43) 628.

and nitrate mixtures, total nitrogen in, determination, (48) 413.

and superphosphate mixtures, experiments, (42) 329.

as top-dressing, (43) 519.

catalyzers for, (41) 723.

composition and action, (46) 820.

conditions for use as fertilizer, (48) 622.

decomposition in south Indian soils, (50) 722.

deteriorated, injurious effects, (43) 628.

dicyanamid determination in, (43) 413.

effect of disinfectants, (44) 817.

effect of iron oxide or salt on, (42) 521.

effect of time of application, (44) 319.

effect on clover, (44) 815.

effect on soil reaction, (48) 216.

fertilizer spreaders, tests, (46) 188.

fertilizing value, (41) 229, 423, 723, 814; (42) 624; (43) 126,

La. 627, 628; (44) 217, 318, Ala. Col. 722, 724; (47) Miss.

217, 322; (48) 520, S.C. 621, 820; (49) 19, 623; (50) 423.

for root knot control, (43) 551.

for weed control, (41) 538.

formation, (43) 628.

hydrolysis products, (50) 9.

improvement, (43) 519; (45) 331.

influence of storage on, (42) 328.

injury to oats, (44) 318.

insecticidal value for nursery

stock, (49) 451.

methods of analysis, (41) 207.

nitriability, (46) 516.

nitrogen determination in, (45) 206.

preparation, (46) 20.

reduction of dustiness, (43) 519.

Calcium—Continued.

- cyanamid—continued.
 - stored, value of, (44) 23.
 - studies, (46) 20, 21.
 - use, (41) 424; (43) 427.
 - v. sodium nitrate for beets, (43) 232.
- cyanid dust, insecticidal value, (49) 849.
- cyanid for gopher control, (46) 455.
- deficiency, effect on parathyroid glands, (50) 162.
- deficiency in soils, (43) Ky. 814.
- deficient diet, effect, (46) 472.
- deposition as affected by a vitamin, (48) 563.
- determination, (47) 804.
- determination—
 - as affected by pH, (47) 109.
 - Gooch method, (42) 413.
 - in blood, (42) 413; (45) 415, 507; (46) 416.
 - in blood of children, (45) 63.
 - in blood, turbidimetry in, (45) 805.
 - in feces, (46) 417.
 - in organic solutions, (43) 204.
 - in presence of magnesium, (46) 310.
 - in presence of phosphates, (44) 803.
 - in saline media, (42) 710.
 - in serum, (44) 114; (46) 203; (50) 112.
 - in soils, (44) 19; (47) Ky. 122.
 - in urine, (46) 417; (47) 109.
 - nephelometric method, (50) 312.
- diffusible, of blood serum, (46) 203.
- displacement by other bases, (44) 630.
- distribution in blood of children, (46) 259.
- distribution in human blood, (48) 361.
- distribution on rachitic and non-rachitic diet, (48) 761.
- effect on alfalfa, (50) 726.
- effect on cows, (48) Del. 670.
- effect on eggs and hens, (46) 876.
- effect on lupines, (50) 426.
- effects in infant feeding, (41) 561.
- excess, effect on skeleton, (50) 856.
- fluorid, fertilizing value, (42) 222, 223.
- function in nutrition of seedlings, (47) 224.
- function in plant growth, (46) 433.
- hydrate, effect on tree growth, (47) 120.
- hydroxid, hygroscopic power, (48) N.J. 353.
- hypochlorite, use as soil disinfectant, (42) 718.
- importance in nutrition, (46) 259.
- in almonds, utilization by man, (50) 764.
- in blood, (47) 14.

1761—31—9

Calcium—Continued.

- in blood during pregnancy, (49) 765.
- in blood, effect of ultra-violet light, (50) 260.
- in blood of rabbit as affected by calcium injections, (44) 64.
- in blood of thyroidectomized animals, (49) 765.
- in carrots, use by man, (42) 760.
- in diet, effect on rickets and growth in pigs, (48) 73.
- in feed, effect on milk yield, (45) U.S.D.A. 274.
- in feeding rations for dairy cows, (48) 398.
- in formation of bone and eggshells, (47) 576.
- in human milk, racial variations, (50) 562.
- in milk, (50) 609.
- in milk and vegetables, relative value, (48) 463.
- in milk, relation to casein digestion, (46) 863.
- in milk, relation to cheese making, (50) 378.
- in oats, (50) 232.
- in oats, relation to nutritive elements, (47) 31.
- in organic matter, microdetermination, (45) 316.
- in plasma, (47) 14.
- in rain water, (49) 413.
- in red blood corpuscles, (41) 267.
- in serum, (47) 14.
- in serum of rachitic children, effect of light, (50) 466.
- in serum, relation to rickets, (46) 165.
- in soils of Greece, (47) 121.
- in soils, relation to soil reaction, (45) 116.
- in vegetables, utilization by man, (47) 763.
- in virgin and cultivated soils, (42) 621.
- ions, rôle in bacterial infections, (41) 83.
- loss from soils, (41) 214.
- metabolism—
 - effect of acid and base-forming diets, (48) 756.
 - effect of cellulose and protein, (50) 571.
 - effect of cod liver oil, (50) 262, 570.
 - effect of dry v. fresh plant tissue, (44) 667.
 - effect of vitamins, (49) 58.
 - in fowls, (43) N.Y.State 574.
 - in rickets, (50) 669.
 - of dairy cows, (45) 273.
 - of infants, (42) 555, 661.
 - of oats-fed horses, (44) 672.
 - of pigs, (45) Ohio 570.
 - of women, (48) 861.
 - relation to milk secretion, (41) 678.

Calcium—Continued.

- neutralizing effect on copper, (45) 29.
- nitrate—
 - artificial, action and use, (43) 125.
 - composition and action, (46) 820.
 - effect on activity of phosphoric acid, (45) 24.
 - effect on rice yields, (44) 831.
 - fertilizing value, (41) 229, 423, Can. 516, 723, 815; (42) 721, Calif. 812; (43) Can. 727; (44) 217; (45) 518; (48) 820; (49) 20.
 - manufacture and use, (43) 628.
 - reduction by cereals, (44) 426.
 - sprays, fertilizing value, (41) Hawaii 148.
 - v. sodium nitrate, (42) 722.
- oxalate formation in leaves, (44) 825.
- oxalate in plants, abnormal abundance, (43) 327.
- oxalate, use as standardizing agent, (42) 109.
- oxid—
 - available in lime, (46) 114, 310.
 - determination in lime, (42) 109.
 - effect on acid soil nutrients, (47) 518.
 - effect on availability of soil potash, (43) Md. 121.
 - effect on barley, (44) 512.
 - effect on sulphate loss from soil, (50) 522.
 - fertilizing value, (44) 24.
 - hygroscopic power, (48) N.J. 353.
 - transformation in soil, (45) 25.
- phosphate—
 - as source of phosphorus, (47) 623.
 - effect on solubility of soils, (43) 517.
 - reverted, determination, (43) Mich. 113.
- phosphates—
 - determination of composition, (42) 110.
 - use to prevent nitrogen loss from manure, (44) 817.
- relation to oral defects, (48) 465.
- removal from soil, (46) N.Y.Cornell 210.
- removal from soil by drainage, (47) Ky. 122.
- requirement for man and animals, (42) 260.
- requirements of man, (44) 563.
- retention, effect of cod liver oil and butter, (45) 666.
- rôle in cultivated plants, (47) 328.
- rôle in nutrition, (43) N.Y.State 574.
- salt deficiency, effect on walnut and citrus, (47) Calif. 626.
- salts—
 - absorption by squash seedlings, (41) 221.

Calcium—Continued.

- salts—continued.
 - antagonistic action, (44) 20.
 - as soil amendments, (41) 326.
 - availability, (50) 362.
 - effect on absorption by orange trees, (49) Calif. 628.
 - effect on glucose determination, (49) 112.
 - effect on magnesium, (42) Calif. 811.
 - effect on orange trees, (50) Calif. 327.
 - effect on soil solubility, (41) Mich. 512.
 - feeding, effects on calcium content of blood, (42) 758.
 - flocculation of soils by, (44) 508.
 - in milk, effect of heat, (46) 802.
 - silicate, effect on wheat, (46) 717.
 - soil, as affected by nitrification and sulfofication, (41) 324, 325.
 - soil, as affected by wheat crop, (41) N.Dak. 124.
 - strontium, and barium salts, differentiation, (45) 206.
 - sulphate, *see* Gypsum.
 - sulphid, effect on plants, (46) 544.
 - sulphid for partial sterilization of soil, (47) 417.
 - sulphid treatment of soils, (41) 515.
 - utilization by swine, (42) Ohio 470.
 - value in the diet, (50) 764.
- Calcium-containing soaps, ash of, (43) 412.
- Calcium-depositing substances, test for, (47) 566.
- Calcium-magnesium interchange, (50) 819.
- Calendra—
 - granaria, *see* Granary weevil.
 - infestation, transmitting from wheat to macaroni through milling, (49) 855.
 - oryza, *see* Rice weevil and Wheat weevil.
 - pertinax, habits of, (43) 762.
 - pertinax, studies, (46) N.Y.Cornell 465.
 - taitensis, notes, (47) 761.
- Calf—
 - clubs, organization, (49) 297.
 - diphtheria in Wisconsin, (49) Wis. 631.
 - diseases, (49) U.S.D.A. 875.
 - infection, cause, (45) 382.
 - lymph, bactericidal action of dyes on, (47) 483.
 - meal, Purdue, feeding value, (43) Ind. 375.
 - meal, Purdue, metabolism studies, (44) 871.
 - meal, Purdue, preparation, (43) Ind. 876.
 - meals—
 - analyses, (41) N.H. 68, Conn. State 176, Ind. 564, R.I. 564, Can. 565, Ind. 868, N.Y.State 868; (42) Mich. 63, Ind. 769,

- Calf—Continued.
 meals—continued.
 analyses—continued.
 N.H. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, N.J. 672, R.I. 672, Ind. 867; (44) Mich. 568, Mass. 671, N.H. 671; (45) N.Y.State 469, N.J. 775, 872, R.I. 872; (46) Can. 168, Mich. 168; (47) N.Y.State 172.
 composition and retail prices, Conn.State, (44) 176; (45) 375.
 feeding value, (44) Pa. 770; (50) Wash.Col. 277.
 metabolism studies, (44) 871.
 use of, notes, (42) 269.
 scours and pneumonia, control, (41) 81.
 scours, cause and control, (48) 281.
 scours, prevention and cure, (43) 183.
 Calfskins, exports from Argentina, (43) 95.
 Caliche—
 nitrate of Amargosa Valley, (41) 323.
 nitrate recovery from, (50) 323.
 California—
 Deciduous Fruit Station—
 establishment, (42) Calif. 695.
 outline of projects, (43) 237.
 Station, notes, (42) 398, 695; (43) 99, 198, 699; (44) 196, 298, 496; (45) 95, 498; (46) 599, 699; (47) 300; (48) 98, 600, 695; (49) 98, 396, 496; (50) 497, 899.
 Station, report, (42) 899; (44) 795; (47) 696; (48) 599.
 University, changes in policy, (44) 794.
 University, notes, (41) 496, 798, 898; (42) 398, 497, 695; (43) 99, 198, 599, 699; (44) 196, 298, 496, 699; (45) 95, 498; (46) 298, 599, 699, 794, 899; (47) 98, 300, 398, 698; (48) 98, 600, 695; (49) 98, 396, 496; (50) 96, 497, 899.
 Caligula cachara, life history, (45) 657.
 Caliroa—
 aethiops, life history, (47) U.S.D.A. 59.
 cerasi, notes, (45) Conn.State 149.
 cerasi, parthenogenesis, (43) 60.
 Callidium n.spp., description, (44) 166.
 Calligrapha exclamatoris, notes, (47) 854.
 Callimorpha fulvicosta, notes, (46) Ky. 157.
 Calliphora—see also Blow flies.
 erythrocephala as anthrax carrier. La. 461.
 erythrocephala, chemotropic response, (43) 554.
 erythrocephala, Empusa disease in, (42) 361.
 lata, overwintering, (48) 157.
 vomitoria, notes, (46) 51.
 Calliphorinae, Indian, notes, (48) 254; (49) 55.
 Callisaurus ventralis ventralis, food habits, (49) 151.
 Callosamia promethea, notes, (41) U.S.D.A. 462.
 Calocoris bipunctatus, notes, (48) 152.
 Calomel—
 electrode, new design, (43) 204.
 use as purgative after anthelmintics, (42) 675.
 Calopelta fallax n.g. and n.sp., (45) 361.
 Calophya nigripennis in New Jersey, (41) 549.
 Calorimeter—
 adiabatic bomb, (41) 503.
 experiments, influence of rate of cooling in, (41) 365.
 for use with large animals, (47) 865.
 Calorimetry—
 animal, studies, (41) 171; (42) 259; (47) 63; (48) 161.
 indirect, Douglas bag method, (41) 172, 761, 856.
 papers on, (44) 859.
 Calosoma—
 beetles, parasite of, (42) 652.
 sycophanta, (41) Conn.State 159; (45) U.S.D.A. 154.
 Calosoter metallicus n.sp., description, (48) 59.
 Calotermes tectonae, notes, (43) 450.
 Calves—
 appetite study, (47) 278.
 baby beef, feeding experiments, (41) Kans. 69.
 beef, development, (44) U.S.D.A. 71.
 beef, sunflower silage for, (44) Mont. 364.
 beef, wintering, (50) Can. 573.
 birth weight, (42) 171; (43) Mo. 176.
 blackstrap molasses for, (45) La. 775.
 breeds, food consumption and gain, (47) Miss. 76.
 bulldog, thyroid gland of, (48) 85.
 carob beans for, (41) Calif. 558.
 cost of raising, (50) Can. 377.
 crossbred, color of, (47) 668.
 dairy, milk substitutes for feeding, (42) 471.
 digestion experiments, (49) N.Mex. 869.
 diseases, (47) Miss. 77.
 diseases, papers on, (47) 80.
 epizootic disease of, (45) 482.
 excretion of indican and phenols, (47) 76.
 fall v. spring, feed consumption, (42) Kans. 264.
 feeding, (41) Mo. 567; (46) Iowa 371; (49) West.Wash. 72.
 feeding and management, (49) 297, U.S.D.A. 875; (50) Wash.Col. 276.
 feeding, appetite as guide in, (42) Iowa 172.
 feeding experiments, (41) N.Dak. 176, 572, Can. 572, Conn.Storrs 871, 873; (42) Calif. 874; (43) Ind. 375, U.S.D.A. 469, 575; (44) 370, Kans. 769; (45) 379, Ariz. 476, Can. 879;

Calves—Continued.

feeding experiments—continued.

(46) U.S.D.A. 765; (47) 76, Wash. 173, Minn. 379, Wis. 467, La. 470, Wis. 479, Wash.Col. 581, 674, Miss. 674; (48) Can. 876; (49) 72, Wash. Col. 275, Wyo. 466, 473; (50) Can. 781.

feeding in Hawaii, (48) 169.

fish meal for, (43) 671.

from purebred sires, improvement, (47) Ark. 772.

growth and nutrition, (47) 781; (48) 772; (50) 275, 579.

heifer, cost of wintering, (42) Kans. 264.

infection with abortion bacilli from cow's milk, (49) 680.

inheritance of congenital cataract, (43) 669.

inheritance of defect of hair and teeth, (43) 672.

management, (47) Miss. 77; (50) 781. microorganisms in lungs of, (48) 278.

milk substitutes for, (43) Ind. 875; (46) Mo. 371; (47) 278; (48) Mo. 669.

newborn—

blood agglutinins relation to proteins, (48) 180.

blood as affected by colostrum ingestion, (47) 463.

composition, (45) Mo. 67.

cow serum as substitute for colostrum, (48) 180.

fat content of feces, (44) 865.

intestinal flora, (43) 183; (45) Mich. 284.

poisoning by iris, (41) 782.

protein requirements, (46) 764.

protein requirements for growth, (49) Pa. 274.

raising, (42) Wash. 599; (47) 280; (49) 173.

raising, minimum milk requirement, (50) Minn. 175, 781.

raising on limited milk, (50) 578.

raising on milk substitutes, (45) Mo. 268; (49) Oreg. 579.

range, wintering, (49) Wyo. 867.

red, occurrence in black breeds of cattle, (43) Wis. 771.

self-feeders for, (44) 271; (49) Mont. 172; (50) 579.

skim milk for, (43) U.S.D.A. 469.

skim milk for, optimum quantity, (49) 676.

systems of marking, (49) U.S.D.A. 875.

veal, feeding experiments, (44) Pa. 770.

wintering, (46) U.S.D.A. 765; (49) Mont. 167.

zinc in muscle tissue, (47) 564.

Calycococcus, new genus, erection, (42) 155.

Calycoseris wrightii, analyses, (44) Ariz. 568.

Calymnia trapezina, notes, (47) 551.

Calyx spray formula, (49) Conn.State 742.

Calyx worm control, (44) 253.

Camachile, notes, (48) Guam 228.

Camallanus americanus n.sp., monograph, (41) 753.

Cambium, significance in physiological problems, (46) 128.

Cambuci, possible economic value, (43) 40.

Camel diseases, (48) 483.

Camel mange cure, (47) 585.

Camels—

attacked by bloodsucking flies, (42) 78.

breeding in North Africa, (42) 560.

colostrum, analysis, (48) 175.

diseases of, (41) 86.

feeding experiments, (41) 869.

hair structure, (44) 467.

international trade, (46) 675.

training, (43) 870.

Camote, culture directions, (45) 35.

Camp cooking, (47) 764.

Campanula carpatica, genetics of, (43) 632.

Camphor—

Bornco, root disease, control, (49) 548.

culture and preparation of products, (50) 140.

die-back, notes, (49) 839.

producing industry of Taiwan, (49) 43.

producing trees, (45) 743.

red scale, effect of freeze of 1917, (43) 555.

scale, control, (48) 852.

scale, Japanese, in Mississippi, (47) 255.

scale, notes, (48) U.S.D.A. 52.

seed, germination tests, (41) 652.

thrips, host plant, (42) 546.

thrips, new, (48) 457.

tree and products, (44) 44.

tree disease, (47) 839.

trees, machine for trimming, (43) U.S.D.A. 90.

Camponotus—

herculeanus japonicus, parasite of, (50) 459.

pennsylvanicus, notes, (42) Minn. 848.

Campoplex pilosulus—

habits, (46) 51.

studies, (49) 555.

Camposella insignata n.g. and n.sp., description, (42) 157.

Campsomeris spp., parasites of white grubs, (42) 550, 755.

Campobrochis, notes, (42) 154.

Can loaders in sugar industry, (42) 284.

Canada—

Experimental Farms, report, (41) 598; (43) 798; (45) 899; (47) 697.

Grain Act, amendments, (46) 694.

Canadian—

- institutions, staff changes in, (46) 397.
- National Live Stock Records, (49) 267.
- Seed Growers' Association, report, (48) 338.
- Society of Technical Agriculturists, (46) 300; (47) 199; (49) 200.
- Society of Technical Agriculturists, editorial, (43) 401.
- Society of Technical Agriculturists, formation, (42) 499.

Canal—

- cleaning, economies in, (50) 286.
- head gates, discharge coefficients, (42) 274.
- head gates, rating curves for, (47) 590.

Canaliculi of Holmgren, significance, (50) 222.

Canals—

- and conduits, hydraulic diagrams for discharge, (48) 486.
- design, (44) 584.
- effect on ground water level, (43) 210.
- irrigation, *see* Irrigation.
- measurements of flow, (41) 583.
- self-cleaning screen for, (42) 577.

Canaries—

- inheritance of exceptional color, (42) 765.
- management, (49) U.S.D.A. 675.

Canary—

- and American finch hybrids, (48) 471.
- breeding and management, (46) 555.
- diseases, (42) 681.
- grass culture in Uruguay, (45) 828.
- grass, fungi on, (49) 445.
- grass, reed, culture experiments, (49) 735.
- seed culture in Morocco, (49) 595.

Canavalia ensiformis, analyses, (41) Ariz. 367.

Cancer—

- in mice, inheritance, (47) 865.
- in white mice, (41) 768.
- inheritance, papers on, (49) 567.
- of plants, studies, (50) 745.
- of the ear of sheep, (50) 585.
- relation to diet deficiency, (43) 667.
- serum diagnosis, (46) 276.

Candies, energy content, (42) 660.

Candy—

- effect on gastric secretion, (44) 665.
- food value, (44) Calif. 762.
- making, use of fruits in, (48) Calif. 508.
- manufacture, raw materials for, (47) 508.
- pear, preparation, (49) Calif. 206.

Cane—*see also* Sugar cane.

- beetle borer in Fiji, (45) 762.
- beetle, mealy, life history, (46) 159.
- borer, red-necked, studies, (49) Wis. 654.

Cane—Continued.

- fruit industry, (49) Oreg. 742.
- fruits, culture, (44) Mont. 337.
- maggot, notes, (49) Oreg. 555.
- pest, control, (50) 457.
- seed, ground, feeding value, (46) Kans. 478.
- seed v. corn, feeding value, (50) Kans. 67.
- sugar, *see* Sugar.
- tops, value for work animals, (45) 573.
- Uba, notes, (48) Hawaii 330.

Canine distemper, *see* Dog distemper.

Canine typhus, notes, (50) 253.

Canker—

- European, on Pacific slope, (50) 148.
- in chickens, popular summary, (44) N.J. 378.

Cankerworm—

- fall, control, (49) N.C. 757.
- fall, natural enemies, (47) 55.
- notes, (44) Iowa 452.

Canna—

- bud rot, studies, (45) 250.
- edible—
 - culture experiments, (41) Hawaii 138; (46) Guam 726.
 - manuring, (46) Hawaii 633.
 - notes, (48) Hawaii 330.
 - production, (44) Hawaii 29, 30.
 - variety tests, (45) Guam 34.
- flower, structure, (44) 45.
- residue, feeding value, (48) Hawaii 368.
- starch, digestibility, (47) 763.
- starch, notes, (48) Hawaii 310.

Canned food with boric acid, effect on poultry, (50) 788.

Canned foods—

- acidity, relation to processing, (45) 161.
- bacteria in, (42) 160; (43) Mich. 115; (46) 859; (48) 754.
- bacteria predominating in, (47) 203.
- processing, heat penetration, (44) 461.
- relation to *Bacillus botulinus*, (42) 261; (45) 167.
- spoiled, and botulism, (45) 570.
- standards for, (46) 15.
- sterilization, (41) 209; (42) 616; (44) 558.
- swells in, (45) 719.
- vitamins in, (47) 768.

Canned—

- meat, inspection in England, (44) 360.
- vegetables, spoilage in, (43) Mich. 114; (49) Colo. 412.

Canneries, inspection, (48) U.S.D.A. 60.

Cannibalism as affected by restricted diet, (49) 767.

Canning—*see also* Fruits and Vegetables.

- and preserving, directions and recipes, (42) 113.
- and preserving in the home, (44) 461, 663.

Canning—Continued.

- apparatus for measuring heat penetration, (41) 14.
- bacteriology of, Kans. (41) 15; (44) 206.
- cold pack method, (42) 616.
- cold pack method, bacteriology, (45) 665.
- *cold pack method outfits, (43) 808.
- cold pack, studies, (44) 663.
- commercial, (42) 113.
- crop industry, research, (46) 336.
- crops, production, (48) N.Y.Cornell 787.
- directions, (43) Can. 316.
- heat penetration in, (45) 719.
- industry in France, (43) 261.
- industry, research problems, (47) 718.
- industry, sanitation in, (49) 462.
- initial temperature, relation to exhaust, pressure, and vacuum, (46) U.S.D.A. 663.
- methods for destroying botulinus spores, (43) 169.
- of fish, (46) 466, 664.
- of foods, (46) U.S.D.A. 208.
- of foods, temperature changes in, (45) U.S.D.A. 560.
- of foods, treatise, (45) 462.
- of meat, (41) 415.
- of vegetables, (41) 668.
- plant wastes in Wisconsin, treatment, (42) 591.
- powder, boric acid, experiments, (48) U.S.D.A. 14.
- principles, (46) 60.
- problems in relation to botulism, (49) 862.
- studies at experiment stations, (46) 608.
- teaching in rural schools, (44) 795.
- vegetables, time for processing, (43) Mich. 115.
- Cantala, grading, baling, and inspection, (50) 434.
- Cantaloupes, *see* Muskmelons.
- Cantao ocellatus, life history, (45) 658.
- Cantharis reticulata, notes, (46) U.S.D.A. 158.
- Canton—
 - Christian College, experimental farm, notes, (48) 397.
 - fibers, grading, baling, and inspection, (50) 434.
 - mud, composition, (50) 319.
- Canvas, mildewproofing and waterproofing, (44) U.S.D.A. 139.
- Canvas, treated, water resistance, (46) 187.
- Capillara sp. in sheep, (46) 685.
- Capillaries, anatomy and physiology, treatise, (50) 379.
- Capillary phenomenon, Bechhold's, (49) 811, 812.
- Capnobotes fuliginosus, wasp enemy, (41) 252.

Capnodium—

- salicinum, notes, (47) 546.
- sp., notes, (47) 839.
- spp. on olives, (42) 45, 645.

Capon—

- and cockerels, growth and feed consumption, (43) Md. 574.
- brooding habits, (41) 871.
- endogenous metabolism, (50) 576.
- production, (41) Md. 180, 774.
- value, (50) Mo. 873.

Caprifigs, varieties, (43) Calif. 238.

Capsaicin, constitution, (41) 310; (42) 707.

Capsella viguieri n.sp., notes, (44) 819.

Capsicum, vitamin A in, (49) 769.

Capsid bug, effect on apple, (44) 453.

Carabao, *see* Water buffalo.

Carabidae species, book of plates, (41) 62.

Caramel, decolorization with kelpchar, (47) 411.

Caraway Phoma root rot, notes, (47) Mich. 447.

Carbazol test for nitrites, (43) 316.

Carbohydrate—

- and amino acid relation in respiration of leaves, (49) 728.
- configuration and bacterial utilization, (49) 610.
- diets, effect on diabetics, (43) 370.
- economy of cacti, (41) 28.
- effect on insulin requirement in diabetes, (50) 766.
- feeding, relation to creatin excretion, (41) 672.
- metabolism, (44) 259, 464; (47) 62, 366.
- metabolism—
 - and diabetes, (44) 65.
 - in alimentary canal, (42) 865.
 - in avitaminosis, (49) 565; (50) 163, 863.
 - in experimental beriberi, (42) 557.
 - in plants, (41) 25, 28; (47) Calif. 625.
 - in rabbits, (44) 464.
- minimum in the diet, (41) 468.
- mixtures, measurement, (49) 610.
- production by sun and shade leaves, (49) 728.
- production in plants, biochemistry, (45) 732; (46) 522.
- reserves of nursery apple trees as affected by winter storage, (49) 138.
- supply and respiration, (45) 334.
- with three carbon atoms from cabbage, (50) 309.

Carbohydrates—

- and alcohol, treatise, (44) 409.
- and fats in nutrition, (49) 362.
- and formaldehyde, synthesis, (47) 728.
- and glucosids, treatise, (43) 410.
- and nitrogen equilibrium, (45) 568.

Carbohydrates—Continued.

- as affected by enzymes in serum, (43) 782.
 - as source of muscular energy, (44) 463.
 - assimilability, limits of, (44) 464.
 - consumption of children, (47) 767.
 - destructive distillation, (44) 204.
 - effect on—
 - coagulation of milk, (44) 258.
 - elimination of endogenous uric acid, (49) 662.
 - nitrogen distribution in urine, (49) 257.
 - nitrogen fixing power of soil, (50) Utah 119.
 - vitamin B requirements, (48) 558.
 - estimation by bacterial procedures, (49) 609.
 - fermentation, (48) 108.
 - fermentation products, (43) 502.
 - fermenting, identification of bacteria in, (43) 113.
 - formation from food fats, (48) 562.
 - formation from proteins, (41) 363.
 - formation in plants, (44) 517.
 - function in maintenance ration, (41) 670; (42) 365.
 - identification by bacterial procedure, (49) 609.
 - in apple trees, form and location, (43) N.H. 28.
 - in asparagus seed, (48) 222.
 - in cacti, studies, (44) 427.
 - in copra meal, nature of, (46) 803.
 - in diet, effect on pancreas, (43) 568.
 - in fruit spurs, seasonal changes and translocation, (47) 729.
 - in navy beans, (45) 714.
 - in pecans, (44) 503.
 - in plant tissues, effects of desiccation, (49) 9.
 - in thrice-boiled vegetables, (45) 665.
 - in vegetables, availability, (42) 457.
 - intermediary metabolism, (50) 361.
 - moisture absorptive power, (47) 801.
 - photosynthesis, (48) 501.
 - predominance in diet, effects, (49) 359.
 - production and consumption in United States, (43) 61.
 - proteins, and fats, unusual proportions in diet, effect, (49) 360.
 - requirement for growth, (45) 764.
 - research problems in, (50) 505.
 - rôle in vitamin hunger, (49) 364.
 - transportation, and excretion, (47) 263.
 - utilization by rats deprived of vitamin B, (49) 857.
 - utilization for muscular work, (41) 563.
 - variation in leaves, (42) 226.
- Carbolic acid—
- effect on plants, (46) 544.
 - for bean seed treatment, (49) 841.

Carbolineum—

- effect on action of calcium cyanamid, (44) 817.
- use against fowl tick, (42) U.S.D.A. 252.

Carbon—

- absorption by roots, (50) 628.
- accumulation in soil, rate, (46) Mo. 315.
- activated sugar, adsorption by, (48) 412.
- activation, (46) 203.
- arc light for treatment of rickets, (47) 665.
- as an adsorbent, (43) 412.
- assimilation, (50) 427.
- assimilation of plants, early products of, (50) 525.
- bisulphid—
 - anthelmintic value, (41) 480; (46) 685; (49) 77.
 - effect on seed germination, (42) Calif. 848; (49) 849.
 - insecticidal value, (41) 480; (43) N.Mex. 352; (44) Mo. 856; (45) N.C. 363.
 - treatment of soils, (41) 515.
 - use against bots, (42) 381, 678.
 - use as soil disinfectant, (42) 718.
- content of soil organic matter, (46) 709.
- content of soils, (44) Kans. 213; (47) 722.
- content of solutions, determination, (49) 803.
- cycle in nature, (50) Mich. 411.
- decolorizing and bone black, (44) 615.
- decolorizing, selection, (47) 508.
- decolorizing, studies, (44) 112.
- determination, (42) 9.
- determination in soils, (41) 206.
- determination in urine, (43) 414.
- determination in vegetable mold, (50) 202.
- dioxid—
 - absorption during photosynthesis, (45) 125.
 - accumulation from strawberries in transit, (44) 536.
 - additions to soils, effect, (50) 625.
 - aerial fertilization of plants with, (41) Vt. 833.
 - and water, polymerization to sugar, (43) 202.
 - as atmospheric fertilizer, (49) 216.
 - as fertilizer, (48) 827.
 - assimilation, (42) 226; (43) 525.
- dioxid assimilation—
 - Blackman's theory of limiting factors, (49) 127.
 - by Neottia, (45) 732.
 - of plants, (44) 132.
 - rôle of chlorophyll in, (42) 527 627.

Carbon—Continued.

dioxid—

- attraction for house fly, (48) 751.
- combining power of blood plasma, factors affecting, (47) 64.
- determination, apparatus, (44) 204; (45) 627.
- determination in alkali bicarbonate, (45) 716.
- determination in carbonates, (44) 203.
- determination on grassed and cultivated soils, (47) 515; (49) 120.
- dissolved, determination, (49) 504.
- dioxid, effect on—
 - Aucuba japonica* cuttings, (49) 836.
 - availability of phosphates, (43) 630.
 - bacteria in dairy products, (47) Ill. 180.
 - germination and growth of fungi, (48) 844.
 - germination of grain, (46) 323.
 - plants, (42) 137; (43) 321, 510; (44) 618, 725; (45) 218, 344, 834; (47) 128, 224, 724, 815.
 - soil acidity, (42) 216.
- dioxid—
 - elimination as index to basal metabolism, (46) 672.
 - elimination by large animals, apparatus for measuring, (44) N.H. 68.
 - fertilization, (42) 723, 816; (44) 218; (46) 321; (48) 823; (49) 741.
 - fertilization, effect of liming, (45) 624.
 - fertilization, theoretical and practical basis, (49) 421.
 - formation in soil, (41) 421.
 - formation, relation to soil moisture, (46) 813.
 - in baking powder, (47) 205, 408.
 - in beverages, (50) 804.
 - in blood as affected by high altitudes, (43) 565.
 - in blood plasma of horses, (48) 778.
 - in milk, N.Y.State (43) 579; (44) 74.
 - in mine water, determination, (46) 805.
 - in self-rising flour, (47) 715.
 - in soil, effect on roots, (44) 729; (45) 335.
 - in soil extracts, effect of fertilizer salts, (43) Mich. 125.
 - in soil, factors affecting, (43) N.Y.Cornell 813.
 - liberated in soil, apparatus for measuring, (47) 212.
 - loss from dough, index of flour strength, (47) 261.
 - manuring, (49) 522.

Carbon—Continued.

dioxid—continued.

- measuring, apparatus, (41) 524.
- nutrition of plants, (44) 814; (47) 128, 224, 724, 815; (48) 126.
- nutrition of plants, relation to manure, (46) 424.
- of air in dairy barns, (44) 688.
- output in walking, (46) 870.
- output of animals and plants as affected by ether, (41) 525.
- percentages for reversal of geotropic curve, (46) 528.
- dioxid production—
 - as affected by gypsum, (49) 727.
 - by streptococci, (46) 274.
 - in *Salvia* as affected by ether, (41) 632.
 - in soil, effect on plant growth, (47) 815.
 - studies, (48) 124.
- dioxid—
 - reaction with hydrogen in soils, (41) 720.
 - reduction, (42) 226.
 - relation to nitrogen nutrition of nitrosoferment, (47) 21.
 - residual effect on roots, (45) 812.
 - supplying power of air, (48) 826.
 - tension, alveolar, relation to meals, (49) 560.
 - tension, effect on *Bacterium abortus* growth, (46) 277.
 - volumetric determination, (42) 412.
- disulphid—
 - as soil insecticide, (44) 852.
 - behavior in soil, (45) 659.
 - diffusion in soil, (48) N.H. 151.
 - fumigation for Japanese beetle, (50) N.J. 56.
 - use against stored grain pests, (49) 153.
 - use against white grubs, (44) 852.
- fixation by algae, (46) 824, 825.
- monoxid—
 - determination in blood, (42) 210.
 - determination in hydrogen, (41) 312.
 - formation in kelp, (44) 28.
 - in kelp, (45) 125.
- nutrition of plants, studies, (44) 132.
- organic, assimilation by moss plants, (42) 226.
- organic, in soil, factors affecting, (49) N.Y.Cornell 117.
- tetrachlorid—
 - and paradichlorobenzene, insecticidal value, (48) Ky. 357.
 - anthelmintic value, (46) 282, 685; (47) 483, 589; (48) 85, 486; (49) 76.
 - effect of simultaneous administration of magnesium sulphate, (50) 684.

- Carbon—Continued.
 tetrachlorid—continued.
 effect on intestinal protozoa, (49) 476.
 effect on parasitic worms, (45) 286.
 fire extinguishers, poisonous gases from, (44) 486.
 for fox parasites, (49) 382.
 for hookworm in dogs, (46) 686.
 for hookworm in man, (48) 151.
 pharmacology and toxicology, (50) 282.
 studies, (50) 380.
 toxicity, (49) 476.
 toxicity, relation to liver function, (49) 382.
 variations in field soils, (41) 124.
 vegetable decolorizing, (43) 412.
 Carbonaceous materials, soil treatment with, (41) 515.
 Carbonate salts in soil, absorption factor, (50) 813.
 Carbonates—
 alkaline, effect on nitrification, (45) 621.
 carbon dioxid in, (44) 203.
 effect on oxidation of sulphur, (45) 332.
 effect on sulphate loss from soil, (50) 522.
 in soils, occurrence, (45) 811.
 loss from soils, (41) 214.
 Carbonic acid—
 action on soil silicates, (46) 821.
 fertilizing value, (46) 720.
 rôle in soil improvement and plant nutrition, (47) 724.
 Carbon-nitrogen ratio in soils, (46) 715.
 Carbons—
 decolorizing—
 action, (47) 719.
 color and ash absorption, (48) 505.
 comparative values, (46) 12, 507.
 discussion, (44) 808.
 effect on colloids and color of cane juice, (46) 508.
 review of literature, (49) 614.
 reactivating, new methods, (47) 411.
 vegetable decolorizing, (45) 509; (47) 206.
 Carcinoma—
 epidermoid, in domestic animals, (45) 76, 382, 884.
 notes, (41) 874.
 Carco as soil insecticide, (44) 852.
 Cardamom disease—
 notes (44) 642.
 survey in India, (46) 544.
 Cardamoms, methods of cultivating, (42) 444.
 Cardwellia sublimis, studies, (42) 349.
 Carex—
 cryptocarpa as silage crop, (41) Alaska 30.
 spp., analyses, (41) Wyo. 333.
 Caribou, cyst-forming protozoa in, (48) 151.
 Carissa, Indian species, (41) 839.
 Carnation—
 flower buds, rate of growth, (46) N.J. 536.
 Fusarium wilt, (49) 45.
 rust in greenhouse, (45) 851.
 rust, notes, (50) 547.
 stem rot, control, (41) Ill. 752.
 yellows, studies, (41) 250.
 Carnations—
 breeding studies, N.J. (44) 337; (48) 340.
 culture, (47) R.I. 144.
 culture and breeding experiments, (41) N.J. 41.
 culture in greenhouse, (49) Ill. 336.
 culture in muck soil, (44) 719.
 effect of soil disinfection, (42) 718.
 Carnauba-wax palm, utilization, (47) 16.
 Carnosin—
 catalytic destruction, (48) 803.
 determination, (47) 805.
 distribution in animals, (47) 858.
 in muscle, effect of cold storage, (47) 858.
 Carob bean pods, feeding value, (49) 173.
 Carob beans—
 chemical and structural study, (50) U.S.D.A. 501.
 composition and retail prices, (45) Conn.State 375.
 culture in California, (41) Calif. 538.
 manufacture of alcohol from, (46) 509.
 nutritive value, (41) Calif. 557.
 Carob cecidomyid, (41) 455.
 Carotin—
 and vitamin A, differentiation, (45) 563.
 determination, (50) 713.
 differentiation from other pigments, (45) 64.
 formation, (44) 629.
 in leaves, (43) 633.
 rôle in sugar production in plants, (42) 527, 627.
 Carotinemia, new clinical picture, (42) 257.
 Carotinoid—
 pigmentation of the skin, (47) 265.
 pigments, biochemistry, (50) Minn. 108.
 Carotinoids—
 as fat-soluble vitamin, (42) 257.
 in plants, (48) 431.
 relation to growth and reproduction, (44) 69; (45) 867.
 Carpenter worm, notes, (46) 750.
 Carpet beetles, control, (50) U.S.D.A. 56.
 Carpet grass—
 culture, (43) U.S.D.A. 233.
 notes, (47) Miss. 428.
 seed, harvesting and cleaning, (43) U.S.D.A. 233.
 seeding experiments, (48) S.C. 629.
 Carpet moth, control. (50) U.S.D.A. 53.

Carpocapsa—

pomonella, *see* Codling moth.
splendana on chestnuts, (50) 661.

Carpomyia vesuviana, trypetid affecting, (49) 849.

Carpophilus hemipterus—

control, (47) Calif. 654.
on dried fruit, (43) 255.

Carrot—

bacterial rot, (46) 44.
beetle, notes, (44) Oreg. 850.
blight, control, (50) 546.
blight, studies, (50) Mass. 650.
disease, new, (46) Mass. 43.
fly, control, (48) 157.
juice, H-ion concentration, (42) 202.
leaf curl, cause and control, (46) 153.
leaf spot, notes, (48) 741.
leaf tip scorch, (46) 647.
nematode disease, (47) Wash.Col. 541.
Phoma root rot, notes, (47) Mich. 447.
seed, vitamin A content, (46) 357.
stalk borer, (42) 152.
tissue, intake of salts by, (44) 425.

Carrots—

analyses, (43) 63.
antirachitic properties, (50) 771.
antiscorbutic value, (41) 860.
as affected by fineness of lime, (43) 325.
as affected by pepto-humic fertilizer, (44) 420.
as affected by sulphur, (46) 822.
ash constituents, (41) 502.
Bacillus botulinus on, (44) 763.
breeding experiments, Can. (43) 735; (48) 31.
calcium of, use by man, (42) 760.
canned, bacterial flora, (46) 859.
carbohydrate content, (42) 202.
cost of production, (46) Miss. 590.
culture directions, (47) Minn. 334.
culture experiments, (41) Can. 528, 737; (43) 638; (44) Hawaii 29, Alaska 328, Alaska 329, 522; (45) Can. 823; (48) V.I. 340; (49) Alaska 426, Alaska 435.
dehydrated, bacteria and molds in, (48) 60.
digestibility in stomach, (42) 862.
effect of deep cultivation, (44) 812.
effect of soil disinfection, (42) 717.
effect on following crop, (44) R.I. 31, 33; (49) 231.
fertilizer experiments, (41) 627; (42) 223; (43) Can. 735.
growth in stony soils, (42) 423.
iodin content, (43) 204, 632.
irrigation experiments, (46) Mich. 537.
lime requirement tests, (44) R.I. 32.
manuring experiments, (50) R.I. 35.
nickel in, (49) 520.
nutritive value, (41) 557; (47) Calif. 668.
overhead irrigation studies, (50) Minn. 139.

Carrots—Continued.

phosphorus requirements, (44) R.I. 31, 32.
preparation for drying, (45) 416.
root development, (43) 834.
seed production, (45) 740, 832.
seed production in Denmark in 1918, (42) 135.
sodium for, (41) R.I. 426.
storage experiments, (48) Calif. 529.
storage rot, notes, (42) N.Y.State 350.
sun-dried, vitamin content, (43) 63; (46) 359.
thinning, (50) Can. 440.
varieties, (41) Idaho 226.
varieties, yields, (47) Mont. 131.
variety tests, (42) Minn. 824, Minn. 835; (43) 232, 236, 638, Can. 735; (44) Mont. 327; (47) Minn. 332, Alaska 527, Calif. 631; (48) Can. 31, 227; (49) Alaska 734; (50) Can. 432, 533.
vitamin A extraction from, (43) 367; (44) 261.
vitamin A in, (43) 165; (48) 656.
vitamin B in, effect of cooking, (44) 562.
vitamins in, (42) 461, 556, 759; (43) 63; (44) 261; (48) 826.
weeding experiments, (41) 737.
white, vitamin content, (47) 465.
with hay, digestibility, (50) Mass. 168.
yields, (43) Wash. 737; (44) 533.
zinc content, (41) 464.

Carter grass, culture in Florida, (41) Fla. 37.

Carthamus tinctorius, anthracnose of, (46) 239.

Carum copticum as source of thymol, (41) 825.

Carvacrol, production of, (42) 503.

Carya glabra hirsuta n.comb., notes, (43) 222.

Cascara tree in British Columbia, (46) 843.

Casein—

alkaline hydrolysis, (46) 612.
analysis, methods, (44) 809.
and Bordeaux mixture, tests, (42) 353.
and limewater, fixatives for Bordeaux mixture, (47) 51.
as protective agent for fat globules of milk, (49) 804.
colloid chemistry, (41) 801.
commercial, composition, (42) 111.
commercial, preparation, (50) 680.
digestibility in vitro, (50) 360.
digestion and absorption, (46) 863.
digestion experiments, (46) 67.
effect on blood regeneration, (44) 565.
fat determination in, (49) 609.
from cow's and goat's milk, (44) 502.
grain-curd, from pasteurized milk, (45) 802.
hydrolytic cleavage products, separation, (50) 108.
hydrolyzed, utilization, (43) 65.

Casein—Continued.

- in Bordeaux mixture, value, (43) 550.
 - in diet, antirachitic value, (46) 473.
 - Indian, proportion of fat in, (49) 609.
 - manufacture, studies, (44) 808.
 - new sulphur-containing amino acid from, (49) 714.
 - of cow's and human milk, (46) 261.
 - pepsin digestion of, (42) 165.
 - preparation, (41) N.Y.State 201, 417; (42) 269.
 - preparation and use, (47) 115.
 - processes of manufacture in New Zealand, (43) 15.
 - purification and precipitation, (49) 802.
 - purification, effect on value, (50) 763.
 - spreaders, value for spraying, (47) Ark. 741.
 - sulphuric, preparation, (45) 510.
 - use in food, (42) 254.
 - use in fungicidal sprays, (47) 242.
 - use in glue making, (42) 507.
 - uses, (48) 673.
 - vegetable, preparation, (45) 617.
 - viscosity studies, (45) 713.
- Casein-lime spreader, value, (50) 346.

Caseinogen—

- composition, (43) 202.
- digestion by trypsin, (42) 60.
- hydrolysis, (46) 112.

Cashew—

- leaf disease, (42) 46.
- nut oil, composition, (50) 308.
- wilt, studies, (43) Tex. 846.

Cassaba melons, history and composition, (45) 741.

Cassava—

- flour, detection, (46) 13.
- meal, feeding value, (43) 73; (46) Hawaii 674; (49) 169.
- meal v. sweet potatoes for pigs, (43) 71.
- meal, value for work animals, (45) 573.
- molasses meal, feeding value, (49) 169.
- residue, feeding value, (48) Hawaii 369.
- roots, alcohol from, (47) 207.
- starch—
 - analyses, (46) 467.
 - digestibility, (47) 763.
 - from, (48) 630.
 - manufacture of alcohol from, (46) 808.
 - notes, (48) Hawaii 310.
 - production in West Indies, (45) 33.
- tubers, Gloeosporium on, (46) 647.

Cassavas—

- acreage and planting time, (44) P.R. 433.
- as stock feed, (44) Hawaii 30.
- breeding experiments, (44) 633; (49) 735.
- comparative analyses, (44) 825.
- culture directions, (45) 35.

Cassavas—Continued.

- culture experiments, (41) 232, 729, 825; (44) 433, 633; (45) 34; (46) Guam 726.
 - culture in St. Vincent, (41) 528.
 - fertilizer experiments, (46) 634.
 - notes, (48) Hawaii 330.
 - production in Brazil, (43) 292.
 - seeding experiments, (46) 634.
 - selection experiments, (41) 636.
 - varieties of Brazil, studies, (44) 828.
 - variety tests, (42) 230; (44) 633; (45) Guam 34; (46) 226, Hawaii 633, 634; (49) Guam 427.
- Casserroles, soluble lead in glaze of, (42) 164.
- Cassia oil, determination of lead in, (43) 14.
- Cassiae-covesii, notes, (47) 839.
- Cassina as food substitute, (46) 755.
- Cassytha, parasitism by, (46) 343.
- Cast iron as reinforcement for concrete, (42) 584.
- Castanea species in Indo-China, (45) 345.
- Castanopsis species in Indo-China, (45) 345.
- Castilleja—
- leaf studies, (42) 433.
 - succulent and mesophytic forms, (41) 29, 133.
- Castor bean—
- disease, (43) 45, 849.
 - disease survey in India, (46) 544.
 - gray mold, studies, (49) N.H. 345.
 - lipase, preparation, (47) 13.
 - meal as poultry feed, (41) 281.
 - meal, detection in feeding stuffs, (45) 413.
 - meal, detection in press cake, (44) 205.
 - podts, Botrytis on, (48) 740.
 - poisoning, (43) 78.
- Castor beans—
- army worm on, (43) 557.
 - as affected by carbon dioxide, (44) 218.
 - bacterial wilt, (45) 352.
 - breeding experiments, (41) 528; (45) 33; (49) 735.
 - culture, (43) 827; (46) 109.
 - culture and use in Brazil, (41) 530.
 - culture and use in Uruguay, (45) 35.
 - culture experiments, (41) 825; (44) 433, 632.
 - culture in Ceylon, (41) 529.
 - fertilizer experiments, (44) 632.
 - germination as affected by organic substances, (41) 523.
 - inheritance studies, (41) 223.
 - lipolytic activity, (42) 707.
 - poisoning horses, (41) 87.
 - production in French colonial possessions, (42) 32.
 - ripe and green, oil content, (42) Calif. 823.
 - seed yield, (47) Calif. 631.
 - variety tests, (44) 433, 632; (45) 734.

Castor cake, fertilizing value, (41) 814, 816.

Castor meal residues, ricin in, (49) 14.

Castor oil—

- adulteration, detection, (47) 716.
- chemistry and uses, (46) 109.
- extraction and utilization, (43) 827.
- industry, (43) U.S.D.A. 802.
- insecticidal value, (42) 78.
- insects affecting, (44) 57.
- plant, protein granules in, (47) 223.
- production, (46) 636.
- seeds, development of aleurone grains in, (50) 222.
- sulfonated, substitutes for, (44) 205.
- use as purgative after anthelmintics, (42) 675.

Castration—

- effect on development, (50) 825.
- effect on hen-feathered cocks, (44) 468, 469.
- effect on secondary sex characters, (42) 466.
- effect on skeleton of animals, (50) 165.
- effects, (48) 674.
- of animals, treatise, (45) 881.
- of cocks and law of retrogression, (44) 865.

Casuarina—

- equisetifolia diseases in Mauritius, (42) 354.
- equisetifolia, fungus symbiosis in, (43) 731.
- plantations, (48) 142.
- root nodules, studies, (44) 521; (49) 745.

Cat—

- diseases, (43) 887.
- hair, microscopic studies, (47) 81.
- meat, detection, (42) 315.

Catabolism, endogenous, and nonprotein constituents of tissues, (48) 62.

Catabomba pyrastris, notes, (41) 852.

Catalase—

- action in yeast cells, (41) 409.
- action in yeast cells, strengthening, (42) 204.
- activity and metabolic activity, (47) 857.
- activity as indicator of nutritive condition of fruit tree, (50) 36.
- activity in apple leaf tissue, (49) N.Y.Cornell 28.
- activity in potato wart tissue, (45) 650; (47) 354.
- activity, measurement, (44) 29; (45) 628.
- activity of apples in storage, (50) 542.
- activity of flour, (47) 505.
- apparatus, description, (42) 412.
- concentration in urine, chyme, and feces, (41) 409.
- determination, apparatus for, (46) 503.
- in blood, determination, (42) 211; (45) 9.

Catalase—Continued.

- in blood during anesthesia, (42) 259.
- in blood, effect of muscular work, (47) 167.
- in blood, effect of protein diet, (48) 161.
- in blood, effect of saccharin, (44) 462.
- in blood, variations in, (43) 569.
- in cheese, (44) 274.
- in fresh and dried vegetables, (41) 202.
- in hens' eggs, (42) 768.
- in milk, apparatus for determining, (45) 315.
- in pollen, (48) 728.
- in seed and viability, (50) 507.
- production—
 - effect of adrenalin and thyroid, (42) 258.
 - effect of chlorin substitution products, (42) 708.
 - effect of pyretics and antipyretics, (42) 259.
 - effect of water, (42) 258.
 - factors affecting, (44) 63.
- reaction, (46) 10.
- relation to animal oxidations, (42) 259; (43) 569.
- relation to tumor tissues, (45) 647.
- study, significance of medium, (47) 711.

Catalpa—

- growth as affected by locust trees, (47) Pa. 442.
- sphinx, control by airplane, (47) Ohio 851; (49) 654.
- Teas' hybrid, (42) 641.

Catalysers for oxidation of ammonia, (43) 816.

Catalysis—

- and industrial application, (45) 201.
- in organic chemistry, (47) 501.
- soil, studies, (49) 418.
- theory and practice, (42) 802.
- theory of, (48) 411.

Catalysts, use in sulfonation of aromatic compounds, (44) 610.

Catalytic—

- decomposition of hydrogen peroxid, (41) 409.
- hydrogenation and reduction, (41) 310.
- power of blood and tissue, (41) 172.
- reactions, treatise, (49) 109.

Catarrh—

- epizootic contagious, (44) 76, 683.
- nasal, among fowl, (50) 878.
- nasal, in poultry, notes, (42) Wash. 397.

Catarrhal fever, malignant—

- in cattle, (42) 883; (43) 384, 584.
- treatment, (47) 486.

Caterpillar—

- aquatic, of *Nymphula* sp., (49) 53.
- droppings, analysis, (44) 420.
- injury to tobacco, (45) 853.

Caterpillar—Continued.

- puss, effects of its sting on man, (50) U.S.D.A. 258.
- salt-marsh, notes, (41) Conn.State 159, 354; (42) Ariz. 357.
- salt-marsh, on cotton, (43) U.S.D.A. 352.
- yellow-bear, notes, (41) 256.

Caterpillars—

- attacking cedar cones, (46) 660.
- effect of strychnin and atropin, (48) 550.
- hairy, control, (47) 357.
- injurious to sugar cane leaves, (48) 357.
- of *Galleria mellonella*, disease of, (48) 54; (49) 155.

Cations—

- effect on permeability, (47) 31.
- penetration into living cells, (47) 424.

Catochrysops strabo larvae, (45) 657.

Cats—

- age and chemical development, (50) 569.
- blood, nature of sugar in, (49) 715.
- bone marrow, histological study, (46) 263.
- cestodes of, keys, (43) 80.
- cuterebra larvae from, (46) 686.
- diseases of, treatise, (46) 276.
- inheritance of coat color, (42) 376. 763.
- internal parasites, treatment, (49) 684.
- intra-uterine sex ratios and degenerating fetuses in, (48) 765.
- newborn, respiratory exchange in, (49) 15.
- on milk diet, metabolic disturbances, (48) 867.
- tortoise-shell tom, cause of sterility, (48) 870.
- tortoise-shell tom, production, (41) 362.
- tortoise-shell tom, studies, (45) 871.

Cat-tail—

- flour, analyses, (42) 457.
- rhizomes, feeding value, (48) 472.
- starch, use for food, (42) 457.

Cattle—*see also* Cows, Calves, Heifers, Steers, etc.

Aberdeen-Angus—

- history, (43) 171.
- history and origin, (50) 368.
- origin and development, (46) 766.
- advanced registry testing, (43) Idaho 378.
- age and chemical development, (50) 569.
- albino, occurrence, (45) 874.
- alfalfa v. clover hay for, (43) Ind. 870.
- and beef in United States, tariff problems, (49) 795.
- and horseflies, summary, (47) Nev. 458.

Cattle—Continued.

- and zebus, crossing, (45) 470.
- as affected by—
 - arsenic, (44) 77.
 - Diplodia infected corn, (44) 78.
 - hydrocyanic acid in Sudan grass, (45) 179.
 - infected *Paspalum dilatatum*, (44) 78.
 - red buckeye, Ala.Col. (44) 778; (47) 785.

Ayrshire—

- breed, (48) 773.
- origin, (43) 176.
- origin and history, (46) 175.

baby beef—

- feeding experiments, (45) 873; (48) 169.
- production, (48) Minn. 662; (49) Wis. 669.
- project study outlines, (44) 596.

balancing rations for, (48) 67.

beef, *see also* Beef.

- barns, (50) U.S.D.A. 190.
- breeding herd, feeding, (49) Miss. 465.
- breeding herd, maintenance, (44) Pa. 769.
- composition, formulas, (48) 167.
- corn fodder for, (44) N.Dak. 364.
- cost of production, (42) N.H. 65; (46) Iowa 366.
- dressing percentage, (42) 867.
- effect of age on economy of gain, (49) Nebr. 772.
- energy cost of fattening, (42) Mo. 65.
- feeding, (41) 564; (48) 570.
- feeding charts, (45) Mo. 267.
- feeding, economics of, (42) N.H. 66.
- feeding experiments, (42) Kans. 263; (44) Mont. 364, Kans. 470; (46) 168, N.Mex. 169, Mont. 364, Kans. 366, U.S.D.A. 675; (47) 75, Pa. 471; (48) N.Dak. 69, Mo. 663; (49) Mont. 167, Idaho 772; (50) Mont. 170, Can. 775.

grain sorghums for, (41) 367.

heifer development, (44) Kans. 470.

judging, (44) 944.

judging, directions, (42) U.S.D.A. 264.

management and feeding, (42) U.S.D.A. 264.

mature v. immature, (42) 868.

pasturing experiments, (49) Miss. 465.

production, (47) 278; (48) U.S.D.A. 290.

production in Cotton Belt, (50) U.S.D.A. 573.

production on pasture, (41) 471.

Cattle—Continued.

beef—continued.

- range experiments, Calif. (47) 668; (48) 569.
- shelter for, (44) N.Dak. 365.
- silage feeding, (41) 368.
- velvet beans for, (41) Ala.Col. 368.
- wintering, (42) Mont. 66; (48) Ohio 664; (50) S.C. 672.
- bleeding for blood tests, (44) Mich. 578.
- blood morphology, (47) 486.
- blood transfusion, choice of donors, (47) 879.
- botulism in, (45) 284.
- Brahman, (50) U.S.D.A. 368.
- Brahman-Hereford cross, (49) Tex. 467.
- branding accredited herds, plans, (42) 877.
- breeding, (46) 269, 674, 872; (49) 72.
- breeding—
 - community, (46) 878.
 - conference on, (48) 700.
 - diseases, (41) 81; (43) 683; (45) 381, 885; (47) 80.
 - experiments, (44) Alaska 364; (48) 868; (49) Alaska 467.
 - for milk increase, (46) 273.
 - in Canada, (46) 872.
 - in Catalonia, (47) 866.
 - in India, (47) 669.
 - in Limagne, (47) 571.
 - in Madagascar, (44) 267.
 - in Morocco, (47) 571.
 - in Netherlands, (44) 293.
 - in North Africa, (42) 560.
 - in Scotland, (43) 67.
 - in Union of South Africa, (50) 367.
 - International Congress for, (48) 500.
 - Jerseys with black and white, (47) 279.
 - occurrence of red calves in black breeds, (43) Wis. 771.
 - records, (43) Me. 175.
- breeds, (49) 778.
- breeds—
 - British, (44) 364.
 - evolution, (50) 573.
 - growth and development, (46) 872.
 - in Porto Rico, (47) 173.
 - milk and fat production, (49) 174.
 - of Frulli, (47) 275.
 - Swiss, identification, (49) 268.
- broom corn seed for, (43) 671.
- buffalo, of India, (41) 777.
- business, cost in tick-infested area, (42) 883.
- care and management, (48) 693.
- census in Mauritius, (42) 669.
- color inheritance in, (45) 874.

Cattle—Continued.

- correlation between characters, (48) 165.
- cost of feeding, (45) Nebr. 596.
- cost of maintaining, (46) Mich. 577.
- crate, design, (49) Mich. 487.
- crisis in Argentina, U.S.D.A. (49) 90; (50) 293.
- cycles of production, (44) N.J. 364.
- daily distance traveled on prairie pasture, (46) N.Dak. 367.
- dairy—see also Cows.
 - advanced registry rules, (43) 176.
 - and beef, crossbreeding, (45) 475.
 - breeding experiments, (43) 575.
 - efficiency standard, (43) 683.
 - elevator screenings for, (43) Can. 868.
 - feeding, (43) Iowa 875; (44) Kans. 271.
 - feeding and management, treatise, (43) 176.
 - feeding costs, (44) 197; (45) 694.
 - feeding standards, (44) 73.
 - industry, changes in, (42) U.S.D.A. 171.
 - judging contest, methods, (42) 473.
 - judging systems, (43) 176.
 - maintenance requirements, (45) Iowa 776.
 - medicating methods, (44) Wash. 581.
 - normal growth, (43) Mo. 876.
 - official testing, (43) Mo. 778.
 - rough rice for, (45) La. 68.
 - sale, suggestions for, (44) Wash. 95.
 - Sudan grass for, (43) Kans. 176.
 - treatise, (42) 269.
- determining age by teeth, (41) U.S.D.A. 769.
- dipping tanks, construction, (43) 90.
- dips and dipping, (41) 286, 376, 873, 874, U.S.D.A. 878.
- disease—
 - due to crab grass, (43) 384.
 - due to feeding sweet clover, (48) 777.
 - midland, cause, (42) 477.
 - new, in France, (41) 878.
 - undiagnosed, (47) Nev. 185.
 - undiagnosed, in New York, (43) 473; (45) 381; (46) 82; (47) 80, 185.
- diseases, (41) 86; (45) Wis. 285; (47) 280; (49) 277; (50) Ill. 73.
- diseases—
 - and parasites in Morocco, (49) 400.
 - causing sterility and abortion, (50) 78.
 - in Mississippi, (42) 381.
 - of genital tract, (49) Calif. 79.
 - of reproductive organs, (47) Mich. 83.

Cattle—Continued.

- diseases—continued.
 - relation to milk supply, (49) 699.
 - relation to public health, (46) 281.
 - summary, (48) 81.
 - treatise, (47) 483.
- distribution in Australia, (48) 597.
- distribution in South America, (46) 269.
- draft, feeding experiments, (50) 672.
- dwarf, of Lower Lusatia, (48) 479.
- early fetus development, (44) 266.
- effect of inbreeding, (44) Del. 267.
- effect of wintering on pasture gains, (49) 868.
- European, acclimatization in Brazil, (42) 370.
- fatalities due to tick, (48) 677.
- fattening, (50) Ohio 170.
- fattening experiments at Vaulx-de-Cernay, (47) 571.
- feed, digestion experiments, errors in, (49) 864.
- feeding, (46) N.J. 273; (47) West. Wash. 876.
- feeding—
 - barns and shelters, (47) Iowa 891.
 - by method of feeding equivalents, (48) 767.
 - equipment, (47) Iowa 891.
 - experiments, (43) N.Dak. 374, Ind. 375; (44) S.Dak. 365, Oreg. 871 (45) Can. 873; (46) 168, N.Mex. 169, N.Mex. 173, Mont. 364, Kans. 366, U.S.D.A. 675, 765, 873; (47) Okla. 70, U.S.D.A. 171, S.Dak. 176, Mass. 273, Colo. 674, Miss. 674, Nebr. 773, Iowa 782, 886; (48) 169, 472, 570, Minn. 661; (49) Guam 464, Nebr. 772, 869; (50) Kans. 65, 170.
 - experiments in Rhodesia, (50) 270.
 - law of diminishing increment, (50) 199.
 - principles, (48) 772.
 - rack, design, (43) 91.
 - treatise, (47) 76.
- feeds for wintering and fattening, (49) Can. 67.
- fetal, sex ratios in, (47) 668.
- genital tract of, bacterial content, (45) 382, 885.
- glands, hemicellulose in, (46) 69.
- grades of salt for, (45) 874.
- grazing, effect of different systems and intensities, (49) U.S.D.A. 866.
- growth investigations, (48) 474.
- Guernsey, (46) 175.
- Guernsey Advanced Registry, effect of age on milk yields, (50) Me. 74.
- Guernsey, breeding, (43) 378.
- Guernsey, transmitting qualities of sires, (43) Me. 175.

Cattle—Continued.

- hair color in, value, (49) 268.
- hemorrhagic disease, (43) Nev. 272.
- herd testing, (47) 280.
- hereditary notch in ears, (48) 264.
- Hereford breed, great members, (48) 398; (49) 865.
- Holstein, inheritance of spotting, (50) 631.
- Holstein, Kreimhild herd, (50) 676.
- Holstein-Friesian—
 - effect of breeding, (45) 678.
 - foundation families, (44) 776.
 - in Great Britain, (42) 564.
 - measurements, (48) 399; (49) 878.
 - true type of breed, (49) 72.
- identical twins in, (46) 872.
- identification by nose prints, (47) 783; (50) 269.
- improvement in Colombia, (42) 371.
- improvement in Denmark, (47) 279.
- improvement of reproductive efficiency, (48) 277.
- in Bombay, statistics, (42) 561.
- in China, (46) 573.
- in Tunis, (44) 267.
- inbreeding in, (49) Ohio 375.
- industry—
 - development in Colombia, (42) 371.
 - in Coastal Plain, survey, (45) U.S.D.A. 268.
 - in Madagascar, (42) 669.
 - in Rhodesia, (50) 171, 469.
 - in tick-infested area, (42) 179, 883.
 - of Southwest, (48) 474.
 - relation to banking, (42) 290.
- inheritance of—
 - belting spotting, (46) 268.
 - color and markings, (43) 375; (45) 375.
 - congenital cataract, (43) 669.
 - defect of hair and teeth, (43) 672.
 - fat in, (48) 399.
 - milk and meat production, (44) 267; (49) Wis. 676.
 - white markings in, (50) 731.
- international trade, (46) 675.
- interstate inspection, (45) 781.
- intestinal parasite of, in Fiji, (43) 883.
- Irish, origin, (43) 171.
- Japanese, body and form, (46) 270.
- Jersey and Red Danish, genetic study of records, (49) 474.
- Jersey, color markings in, (42) 472.
- Jersey, inheritance of color markings; (46) Ky. 372.
- Jersey, transmitting qualities of sires, (43) Me. 175.
- judging, (46) Wis. 74.
- judging and selecting, formulas, (47) 68.

Cattle—Continued.

- judging for selecting dairy cows, (43) Me. 175.
- judging, treatise, (43) 697.
- Kerry, history and description, (47) 581.
- larkspur poisoning, (41) Wyo. 407.
- length of life, (44) 866.
- lice, control, (46) Mich. 559.
- loans, (41) U.S.D.A. 674.
- loss by foreign bodies in digestive tract, (46) 882.
- loss of weight during transportation, (43) 672.
- maintenance requirements, (46) 168; (47) Mo. 468; (48) Vt. 374.
- mange in Canada, (47) 181.
- maoilin, of Ireland, (41) 269.
- market, two-day, at Chicago, (46) 894.
- metabolism of, (44) 68.
- mineral requirements, (49) 72.
- neutrality regulation in, (46) 74.
- new oestrid parasite of, (48) 485.
- oak poisoning, (41) U.S.D.A. 191.
- of eastern France, (41) 472.
- of Madagascar, (47) 375.
- official testing, (49) Oreg. 579.
- ovaries, corpora lutea in, (46) 266.
- ovary, anatomical development, (49) 781.
- parasite of, in Philippines, (48) 84.
- parasites of, (45) 77; (47) 483; (49) La. 283.
- pea straw for, (43) 870.
- plague, *see* Rinderpest.
- poisoning, (45) Nev. 782.
- poisoning—*see also* Livestock and Forage poisoning, Plants, poisonous, and specific plants.
 - by arrow grass, (43) Nev. 77.
 - by *Astragalus tetrapterus*, (43) U.S.D.A. 78.
 - by *Diplodia*-infected corn, (45) 583.
 - by ergotized *paspalum*, (45) 179.
 - by food and water, (44) 581.
 - by lupine, (43) Wyo. 783.
 - by milkweed, (44) Nev. 875.
 - by sorrel, (45) 583.
 - by whorled milkweed, (43) U.S.D.A. 470.
 - by yerba manza, (44) 180.
- polydactylism in, (45) 874.
- poppy seed cake for, (43) 777.
- popular articles on, (47) 866.
- pregnancy in, diagnosis, (49) Calif. 79.
- prices, (43) U.S.D.A. 595.
- production, inheritance, and growth in, (48) Ky. 175.
- protein requirements for growth, (46) 764; (49) Pa. 274.
- purebred, Brazilian market, (42) 370.
- purebred, prices, (45) 267.
- purebred, tests, effect of leaving milk in udder, (49) Pa. 274.

Cattle—Continued.

- raising, (48) Mont. 377.
- raising—
 - courses in, (49) 96.
 - in Colombia, (46) 391.
 - in Pennsylvania, (44) Pa. 769.
 - in Rhodesia, (41) 869.
 - in southern Brazil, (41) 671.
 - in the Southeast, (41) 869.
 - on Madeira Islands, (49) 474.
- range—
 - care of, in Philippines, (44) 868.
 - cause of losses, (47) U.S.D.A. 469.
 - emergency feeds for, (41) Tex. 70.
 - feeding experiments, (43) N.Mex. 374.
 - improvement, (45) 375.
 - management, (41) U.S.D.A. 565.
 - management during drought, (47) U.S.D.A. 468.
 - silage for, (41) Ariz. 368.
 - thistle silage for, (41) N.Mex. 176.
- ranges, western, fences for, (47) 278.
- reactors to tuberculin test, retest of, (42) 476.
- registering in Friesland, (46) 878.
- reproduction as affected by oat rations, (44) Wis. 672.
- reproductive cells, (41) Idaho 270.
- reproductive organs, bacteriology, (47) 80.
- rice meal for, (43) 172.
- rôle in malaria prophylaxis, (43) 454, 853.
- roughages for, (47) Ark. 772.
- salting studies, (49) Kans. 466.
- scab, control, (43) 272; (45) 680.
- scab, eradication, (43) U.S.D.A. 471.
- selecting for hornlessness, (41) 868.
- self-breeding, (48) Ohio 663.
- Shorthorn—
 - breeders' guide, (47) 669.
 - changes in type, (45) 470.
 - colors of, (50) 128.
 - history, (43) 171.
 - in Scotland, (46) 72.
 - weights of, (41) 367.
- spermatogenesis, (43) 670.
- sterile twins in, body form, (44) 67.
- sterility in, (46) Mich. 482; (48) Minn. 179; (50) 788.
- sterility in, treatment, (44) 581.
- Stjersund, inheritance of muzzle color in, (45) 69.
- sucking louse affecting, (45) 853.
- sunflower silage for, (45) 169.
- surface area, determination, (50) 268.
- Syngamus laryngeus* in, (43) 688.
- temperature, normal range, (44) Mont. 377.
- temperature, variation in, (45) 885.
- testing with human and bovine tuberculin, (49) 783.

Cattle—Continued.

- tick—*see also* Ticks.
 - arsenicals for, preparation, (44) 78.
 - control, (45) V.I. 150.
 - eradication, U.S.D.A. (41) 878; (43) 471.

tick, eradication—

- in Alabama, (42) 776.
- in Porto Rico, (42) 779.
- in South, (44) 184.
- relation to cost of cattle, (42) 179, 883.
- State laws and court reports, (46) U.S.D.A. 281.

tick—

- in Australia, (41) 82, 280, 578; (44) 581.
- in Guam, (49) Guam 480.
- in New Zealand, (47) 486.
- in Porto Rico, (45) 583.
- in South Africa, (41) 286.
- life history, (42) 678; (44) 184.
- notes, (48) 182.

tick-resistant, studies, (43) 182.

treatment to prevent ox-warble infestation, (46) 684.

tuberculinization method by double local reaction, (49) 78.

tuberculous, disposition of, (45) 283.

tuberculous, report of Wisconsin detention farm for, (42) 878.

twinning in, (45) Me. 677; (47) Ohio 176.

unlimited silage rations for, (47) 278.

winter ration, wheat straw in, (45) Kans. 267.

wintering, (49) Idaho 779.

work oxen of Morocco, tests, (41) 368.

zebu, of Morocco, tests, (41) 368.

zinc in muscle tissue, (47) 564.

Cattleya, insects affecting, (46) 741.

Cauliflory in apple trees, (42) 353.

Cauliflower—

- analyses, (43) 63.
- as affected by carbon dioxid, (45) 834.
- as greenhouse crop, (44) Oreg. 834.
- bacterial disease, (43) 152.
- black rot, studies, (50) N.Y.State 546.
- blackleg, notes, (44) 842.
- canning, (49) Oreg. 507.
- carbohydrates, availability, (42) 457.
- culture, Alaska, (47) 535; (49) 435.
- culture in muck soil, (44) 719.
- disease, obscure, studies, (50) N.Y.State 546.
- diseases, (45) 649.
- greenhouse, improved strains, (47) 339.
- hardening process in, (46) Mo. 827.
- maggot control, (47) Ind. 156.
- manuring experiments, (50) R.I. 35.
- propagating in peat pots, (44) 40.
- root development, (43) 834.
- soft rot, notes, (48) 242.
- variety tests, (41) N.Dak. 147; (42) Minn. 835.

Caulophilus latinasus—

- affecting corn, (44) 760.
- life history and habits, (48) 58.
- notes, (43) 851.

Cecidia from Egypt, (45) 763.

Cecidomyia—

- destructor, *see* Hessian fly.
- mosellana, notes, (47) 550.

Cecropia moth, natural control, (49) 50.

Cecum, development in ox, (42) 179.

Cedar—

- analyses, (48) 416.
- chests, protection against clothes moth, (47) U.S.D.A. 162.
- distribution and uses, (42) 44.
- heart rot, notes, (47) 348.
- incense, dry rot, control, (44) U.S.D.A. 156.
- incense, susceptibility to fire injury, (50) 544.
- red, for Kansas, (41) Kans. 46.
- red, infection by Gymnosporangium, (48) 747.
- rust, eradication, (42) 645.
- rust, notes, (46) 543.
- rust on apples, control, (46) 451.
- rust on apples, relation to cedar trees, (42) 746.
- rust survey in Virginia, (46) 243.
- seedlings, damping-off, (47) 839.
- tree eradication in apple-growing sections, (46) 243.
- volume tables, (41) 838.
- western red, of British Columbia, (46) 236.
- western red, uses and stresses, (44) 149.
- white, ant injury, (41) 63.
- white, for windbreaks on moist soils, (42) Mich. 348.
- white, of Dismal Swamp, (50) 744.
- white, root development, (48) 42.
- wood, structure and strength, (48) 239.

Cedrela—

- n.spp., descriptions, (46) 644.
- toona, culture, (46) 445.

Celama (Nola) sorghiella, notes, (48) U.S.D.A. 52, 650.

Celery—

- analyses, (43) 63.
- as affected by cyanamid treatment, (41) Fla. 548.
- bacterial leaf spot, control, (45) 246.
- bacteriosis, studies, (47) 350.
- blackheart, control, (42) 541.
- blackheart, notes, (41) Fla. 543; (45) 47.
- blanching, harvesting, and marketing, (47) West.Wash. 536.
- blanching tests, (50) Can. 440.
- blight, control, (42) 541; (46) 543; (50) 651.
- blight, late, spraying experiments, (46) 844.
- blight, studies, (41) N.J. 50; (42) 541; (45) 47.

Celery—Continued.

- caterpillar, notes, (45) Conn.State 149.
- crinkle, (44) Conn.State 150.
- culture, (47) Alaska 535, U.S.D.A. 742; (48) Utah 38.
- culture in home garden, (41) Ohio 147.
- damping-off in greenhouses, (50) 549.
- damping-off, studies, (41) Fla. 542; (48) N.J. 347.
- decay, cause, (44) 643.
- digestibility in stomach, (42) 862.
- diseases, (41) N.J. 50, Mich. 654, 745; (43) N.J. 153; (45) 649; (46) N.J. 547.
- fertilizer experiments, (44) R.I. 21; (47) R.I. 419, 725; (48) N.J. 340.
- fly, life history and control, (48) 157.
- hardening process in, (46) Mo. 827.
- insulin in, (50) 767.
- iodin in, (43) 632.
- leaf blight, control, (49) Mich. 443.
- leaf spot, notes, (48) 842.
- leaf-tyer, natural enemies, (48) 357.
- leaf-tyer, studies, (41) 460.
- mosaic, description, (50) 747.
- Phoma root rot, (44) 843.
- Phoma root rot, description, (47) Mich. 447.
- premature seeding, (44) Mont. 336; (50) 300.
- root development, (43) 834.
- root rot, control, (48) N.J. 347.
- root rot, studies, (45) Mich. 241.
- roots, iodine content, (43) 204.
- Sclerotinia rot, studies, (47) N.J. 149.
- seed production, (48) Can. 38.
- seed treatment for Septoria blight, (45) 446.
- seeds, preserving value, (42) 114.
- Septoria apii on, (45) 748.
- smut, notes, (45) Mich. 241.
- spray residue on, (47) U.S.D.A. 360.
- spraying experiments, (44) Mass. 445.
- storage cellar, Bordeaux dust for, (50) Can. 339.
- studies, (50) S.C. 643.
- varieties, disease resistant, (43) Md. 144.
- variety tests, (41) N.Dak. 147.
- vitamin B in, (44) 261; (47) 267.
- worm, notes, (41) U.S.D.A. 462.
- yellows, (47) 350.
- yellows-resistant strain, (50) 651.

Cell—

- division, amitotic, (41) 861.
- division, distribution of the Golgi apparatus during, (45) 371.
- division in arborescent gymnosperms, (44) 521.
- division of onion, mitotic stages, (44) 630.
- growth, forces concerned in, (47) 222, 423.
- growth, relation to energy, (43) 131.
- masses, action of bases and salts on, (45) 820; (48) 824.

Cell—Continued.

- membranes, acidity of, (42) 334.
- nuclei, passage of undissolved substance from, (43) 524.
- nuclei, size and function, (43) 524.
- regeneration in Botrytis, (41) 346.
- vacuoles in roots, origin, (46) 823.
- wall structure of cotton hairs, (50) 629.
- Cellars, damp-proofing, (43) U.S.D.A. 485.
- Cells—
 - animal, *see* Animal cells.
 - artificial, use, (45) 628.
 - autooxidizable constituent, (46) 110.
 - chemistry, rôle of vitamins in, (47) 168, 860.
 - detached root-cap, viability, (43) 130.
 - living, oxidative mechanism in, (50) 461.
 - meristemic, as affected by stimulation, (43) 130.
 - oxidation mechanisms, (47) 62.
 - plant—*see also* Plant cells.
 - and animal, permeability, (41) 631.
 - reproductive, of cattle, (41) Idaho 270.
- Celluloid, colloid chemistry, (41) 801.
- Cellulose—
 - as emergency feed, (43) 170.
 - as feeding stuff, (45) 170.
 - bleaching, treatise, (47) 207.
 - chemistry of, (42) 409.
 - chemistry of, progress, (41) 613.
 - chemistry, textbook, (47) 502.
 - composition and digestibility, (45) 672.
 - constitution, (50) 505.
 - decomposition as affected by manure, (48) 217.
 - decomposition by aerobic organism, (41) 632.
 - decomposition by bacteria, (45) 821.
 - determination, (42) 612; (45) 615; (47) 312.
 - determination in wood, (41) 14; (42) 614.
 - digestibility, (46) 68.
 - digestion, bacteriological studies, (44) 566.
 - digestion by intestinal flora of man, (50) 763.
 - digestion in vitro, (43) 670.
 - effect on inorganic metabolism, (50) 571.
 - esters, chemistry and technology, treatise, (45) 204.
 - esters, technology, (45) 801.
 - fermentation, (46) 69, 70.
 - fermentation by *Aspergillus cellulosa*, (44) 567.
 - fermentation, relation to bacteria, (44) 26.
 - from bast fibers, (45) 511.
 - hydrolysis, determination of degree, (45) 615.
 - hydrolysis, studies, (47) Calif. 625.

- Cellulose—Continued.
 hydrolysis, theory and practice, (46) 203.
 hydrolyzed, use as feeding stuff, (44) 71.
 in woods, determination, (44) 312.
 industry, (41) 734.
 mannose in, (49) 206.
 manufacture from corncobs, (43) 809.
 of cereal straw, (41) 202.
 phthalate, preparation and properties, (44) 10.
 raw and hydrolyzed, method of distinguishing, (43) 315.
 researches on, (48) 203.
 rôle in plant life, (46) 722.
 standard cotton, preparation and analyses, (50) 206.
 structure, determiners, (50) 629.
 wood, acetolysis reaction, (50) 509.
 wood and cotton, comparison, (47) 809; (50) 9.
 wood, nature of, (50) 206.
 wood pulp, nitrating, (41) 14; (42) 116.
- Celluloses, separation and determination, (49) 409.
- Celyphidae species, life history, (47) 358.
- Cement—*see also* Concrete.
 as affected by alkali, Wyo. (43) 789; (47) 188.
 as affected by sulphur compounds, (48) 487.
 caustic magnesia, summary, (48) 783.
 colloid chemistry, (41) 801.
 composition, manufacture, and properties, (48) 589.
 disintegration in sea water, (50) 187.
 draintile, durability in alkali soils, (48) 184.
 dust, effect on plants, (47) 749.
 dust, potash from, (41) 518.
 effect of calcium sulphate, (42) 583.
 effect of salts, (48) 682.
 effect of storage, (45) 391.
 for quick-hardening concrete, composition, (42) 889.
 joints for cast-iron gas pipes, (43) 482.
 kilns, potash recovery from, (46) 220.
 manufacture and trade, (47) 189.
 mortar, bonding, (41) U.S.D.A. 382.
 mortar strength, effect of expressing mix water, (42) 583.
 pipe, machine-made, Ariz. (41) 288, 379.
 plant, state owned, (44) U.S.D.A. 884.
 plants, potash recovery in, (42) 124, 221.
 Portland, as affected by magnesium sulphate, (47) 291.
 Portland, setting, (49) 484.
 Portland, specifications, (41) 584.
 production and use in 1918, (43) 282.
 production, consumption, and foreign trade in 1921, (49) 588.
 treatise, (46) 888.
- Cenangium abietis on pine, (48) 647; (50) 150.
 Cenangium piniphilum n.sp., description, (48) 647.
- Centaurea—
 maculosa, notes, (44) Pa. 737.
 plicris, notes, (47) 829, Kans. 830.
 variations in sex, (45) 629.
- Centeter cinerea n.g. and n.sp., description, (49) 453.
- Centeterus (Phaeogenes) ineptifrons n.sp., description, (41) 63.
- Central Agricultural Council in Denmark, (43) 600.
- Centranthus ruber, anatomy of polycotylous seedlings, (42) 725.
- Centrifugal force, effect on plants, (48) 828.
- Centrifugalization at low temperatures, device for, (42) 312.
- Centrinus penicellus, life history, (43) 762.
- Centrodora and Paraphelinus, synonymy, (41) 360.
- Centronyx, status of, (41) 250.
- Cephaleia abietis (Lyda hypotrophica), notes, (41) 847.
- Cephaleia signata, notes, (41) 455; (44) 250.
- Cephaleuros—
 mycoidea, notes, (46) 845; (47) 754; (50) 447.
 spp., notes, (42) 145, 747; (49) 45.
 virescens, notes, (41) 842; (44) 750; (50) 42.
- Cephalic indexes, (49) 770.
- Cephalin of brain in avitaminosis, (50) 862.
- Cephalina species. lists, (48) 462.
- Cephalonomia kiefferi, notes, (43) 259.
- Cephalosporium—
 lecanii on green bug, (41) 59.
 sacchari, notes, (44) 51; (46) 45, 647; (48) Del. 643, Mo. 644; (49) 542; (50) 546.
 sacchari on corn, (46) Del. 239, 547; (49) 243.
 sp., notes, (49) 45.
- Cephenomyia trompe, notes, (47) 257.
- Cephus cinctus, studies, (43) U.S.D.A. 259; (48) 852.
- Cephus cinctus, summary, (47) 762.
- Cephus compressus, notes, (44) 167.
- Cephus spp., differentiation, key, (43) U.S.D.A. 260.
- Cephus spp., notes, (43) U.S.D.A. 363.
- Cerambycidae, paper on, (48) 252.
- Cerambycini larvae, construction of calcareous opercula, (43) 57.
- Ceraphron pallidiventris, parasitism by, (43) Mass. 158.
- Ceraphron sp., parasitism by, (44) Va. 756.
- Cerapterocerus mirabilis, notes, (43) 252.
- Ceratitis capitata, in Hawaii, studies, (42) 654.
- Ceratitis capitata, notes, (47) U.S.D.A. 157; (50) 54.
- Ceratocarpia cactorum, notes, (42) 45.

- Ceratodon purpureus*, assimilation of organic carbon by, (42) 226.
- Ceratonia catalpae*, see *Catalpa sphinx*.
- Ceratostomella*—
- piceae*, notes, (49) 250.
 - pilifera*, notes, (49) 447.
 - spp., penetration into hardwood, (50) 656.
 - spp., stain produced by, (48) 649.
- Ceratoteleia marlatti*, parasitism by, (47) S.Dak. 451.
- Ceratotheca sesamoides*, oil of, notes, (42) 115.
- Cercariae*, encysting, infesting fresh-water snails, (42) 678.
- Cercocephala elegans*, notes, (48) 58.
- Cercopidae* of Washington, D. C., (44) 853.
- Cercopidae*, paper on, (45) 454.
- Cercospora*—
- angulata*, notes, (46) 243.
 - apii*, see *Celery* blight.
 - averrhoi* n.sp., description, (48) 119.
 - batatae*, notes, (47) 348.
 - beticola* on beets, (45) 47.
 - beticola* on sugar beets, (46) 450.
 - brunkii*, notes, (45) Md. 451.
 - capsici*, notes, (49) Ga. 346.
 - circumscissa*, injury by, (42) 846.
 - coffeicola*, notes, (46) 647; (47) 44, 348, 839; (48) 149.
 - cruenta*, notes, (48) Del. 643.
 - gossypina*, notes, (45) 649.
 - kopkei*, notes, (46) 45.
 - kopkei* on sugar cane, (42) 46.
 - medicaginis*, control, (44) Ala.Col. 744.
 - medicaginis*, studies, (43) 652; (44) 748; (48) 846.
 - melongenae* n.sp., notes, (50) 748.
 - nicotianae*, notes, (42) 46; (43) 246; (48) Fla. 646; (49) Fla. 838.
 - on pepper, (41) Fla. 543.
 - oryzae* on rice, (42) 46.
 - personata*, notes, (44) 445; (48) 44.
 - personata* on peanuts, (42) 145, 350; (50) 146.
 - personata*, studies, (42) 542.
 - personata*, synonymy, (46) 648.
 - pisi-sativae* n.sp. description, (42) 46.
 - rosicola*, notes, (43) 152; (44) 750.
 - sacchari*, notes, (41) 450.
 - sechii* n.sp., description, (42) 46.
 - sorghii*, notes, (47) 544.
 - spp., notes, (43) 544; (45) 48; (46) 451, 845; (47) Fla. 650; (48) 741, 842; (50) 248.
 - spp. on potato, (45) 145.
 - vaginae*, notes, (45) 443; (46) 647.
 - viticola*, notes, (42) 49.
- Cercosporella*—
- acerina*, notes, (42) 46; (46) 44.
 - albo-maculans*, notes, (44) Conn.State 150.
 - persica*, morphology and systematic position, (46) 239.
 - theae*, notes, (45) 843.
- Cercosporina juncicola* n.sp., description, (50) 248.
- Cercothrips*, new genus, erection, (42) 154.
- Cercyonia citri* n.sp., notes, (48) 654.
- Cereal**—
- blight as affected by soil temperature, (47) 246.
 - breakfast foods, analyses, (42) 162.
 - by-products, chaff content, formula, (46) 71.
 - chemistry, phases, (50) 710.
 - crop situation in Bulgaria, (48) U.S.D.A. 529.
 - crops, relation to weather, (43) 44.
 - diseases, (41) Can. 543, Mich. 654; (42) 242, 541; (43) 652; (44) Oreg. 841; (45) 647; (46) 448, Kans. 448; (47) Calif. 647; (49) N.Dak. 343.
 - diseases in England and Wales, (49) 645.
 - diseases in Kentucky, (49) Ky. 541.
 - diseases, seed treatment for, (42) 542.
 - diseases, transmission through seed, (42) 351.
 - Division, activities, (50) Can. 231.
 - extracts, protein removal from, technique, (49) 110.
 - flag smut in United States, (41) U.S.D.A. 746.
 - foods, analysis, official method, (44) 9.
 - fungus diseases, control, (50) 245.
 - hay, culture in Australia, (48) 630.
 - hay, feeding value, (47) Calif. 673.
 - hay, varieties, (44) Calif. 731.
 - insects, control, (47) Ohio 358.
 - leaf rusts, studies, (43) Ind. 345.
 - meals for calves, (44) 776.
 - mildew, notes, (43) 45.
 - products, acidity determination, (42) 11.
 - products, fat determination in, (45) 206.
 - products, nutritive value, (42) 456.
 - products, protecting from insect attack, (50) Minn. 152.
 - research, Federal and State cooperation in, (49) 492.
 - reserves, conservation, (45) 663.
 - rots, studies, (50) Minn. 144.
 - rust, black, in Sweden, studies, (42) 243.
 - rust, black, invasion of, (44) 342.
 - rust, control, (44) Calif. 744; (46) Mont. 343.
 - rust in Wisconsin, (41) Wis. 842.
 - rust, popular account, (41) U.S.D.A. 655.
 - rusts, notes, (41) Can. 543; (42) Iowa 448; (43) Okla. 44; (45) 444; (50) Minn. 144.
 - rusts, relation to vegetative vigor of host, (50) 43.
 - rusts, studies, Minn. (44) 745; (47) 347.
 - seed as affected by chloropicrin, (45) 537.
 - seed, treatment, (45) 28, 542; (46) 449; (47) 542.

Cereal—Continued.

- seeds, fungi on, (49) 443.
 - seeds, germination capacity, (44) 821.
 - Septoria diseases, (50) 648.
 - smut, control, (43) Colo. 150; (44) Calif. 744; (46) 545.
 - smut, germination, relation to H-ion concentration, (46) Mo. 344.
 - smut, infection percentages, (42) 351.
 - smut, resistance and control, (45) 49.
 - smuts, control, (42) 47, Calif. 47; (45) 444, 747.
 - smuts, notes, (41) 747; (42) Calif. 843; (43) Okla. 44, 445.
 - stalk disease, control, (43) 750.
 - stripe disease, control, (42) 47; (44) 842; (45) 49.
 - stripe disease, infection percentages, (42) 351.
 - stripe disease, resistance, (45) 49.
 - stripe rust, notes, (44) Oreg. 842.
 - take-all disease, (41) U.S.D.A. 746; (50) 549, 746.
 - yellow rust, notes, (44) 842.
- Cereals—*see also* Barley, Oats, Wheat, *etc.*
- analyses and use as feeding stuffs, (45) 373.
 - as hay crops, (47) Calif. 631.
 - border effect, studies, (48) 435.
 - breeding data, recording, (44) 521.
 - breeding experiments, (41) Can. 528; (42) S.Dak. 827; (44) Kans. 224, 632, Oreg. 826.
 - breeding experiments, recording, (50) 828.
 - breeding in Italy, (50) 333.
 - breeding institutes in Italy, (47) 195.
 - calcium nitrate reduction, (44) 426.
 - congress of, proceedings, (49) 736.
 - copper determination in, (44) 62.
 - cultivation, implements for, (43) 892.
 - culture, Alaska, (44) 328, 329.
 - culture, Devaux method, (42) 230.
 - culture experiments, (42) Va. 436, S.Dak. 827; (44) Utah 525, 632, Oreg. 826; (45) 340, Ariz. 429, 532; (46) 131; (47) Minn. 130; (48) 629.
 - culture experiments in Ontario, (41) 333.
 - culture experiments on dry and irrigated land, (47) U.S.D.A. 330.
 - culture in Alaska, (41) Alaska 30.
 - culture in Australia, (48) 630.
 - culture in Cyprus, (44) 137.
 - culture in Malaya, (48) 732.
 - culture in Nigeria, (43) 637.
 - culture, treatise, (47) 823.
 - culture under irrigation, (43) U.S.D.A. 637.
 - cytological studies, (49) 25.
 - determination of moisture, (42) 415.
 - determination of specific weight, (45) 344.
 - determination of water in, (41) 799.
 - development of endosperm in, (48) 431.

Cereals—Continued.

- Dilophospora graminis on, (47) 45.
- double germination, (45) 532.
- effect of cold on, (43) 432.
- effect of deep cultivation, (44) 812.
- effect of time of application of nitrogen, (44) Calif. 723.
- exotic, tests in Algeria, (45) 35.
- experiments, (49) U.S.D.A. 825.
- feeding power and fertilizer response, (48) R.I. 518.
- fertilizer experiments, (41) 228; (42) Va. 436, S.Dak. 827; (44) 632.
- fungi affecting, (44) Minn. 745; (46) 239.
- germinability, effect of hot water treatment, (45) 144.
- germination, (50) 238.
- germination, forcing, (48) 633.
- Helminthosporium on, (46) 742.
- hybridization, (50) Alaska 533.
- in Algeria, improvement, (49) 736.
- in Bulgaria, analyses, (46) 30.
- in Tropics, (42) 599.
- insects affecting, (43) 652; (44) 57.
- insects affecting in India, (45) 656.
- interim report, (50) 690.
- internationalizing trade in, (45) 897.
- lodging in, (41) 636.
- lodging in, effect of potash, (42) 530.
- manganese and iron determinations, (49) 520.
- moisture content, measuring, (44) 504.
- nutritive properties, (46) 161.
- pedigreed varieties, development and testing, (47) Mich. 129.
- phylogeny, (47) 529.
- production in Alaska, (42) 93.
- production in Cuba, (42) 31.
- production in Rumania, (48) U.S.D.A. 597.
- production in Spain, (45) 696; (46) 696; (49) 193; (50) 795.
- protection from insects, (45) 552.
- recent Strampelli, (50) 437.
- relation of potassium to growth, (43) N.H. 29.
- research on, (46) 30; (49) U.S.D.A. 825.
- response to nitrogenous fertilizers, (50) 232.
- rôle in nutrition of infants, (42) 462.
- rotation experiments, (44) Utah 525, 827.
- seed identification, (44) 143.
- seed tests, (44) 143.
- seed treatment, (41) Mich. 654.
- seed treatment with ammonium nitrate, (41) 730.
- seed treatment with dry heat, (42) 644.
- seeding amounts, effect of phenological conditions, (42) 511.
- seeds, absorption of water by, (44) 233.
- selection, methods of, (41) 529.
- source of European supplies, (42) 439.

Cereals—Continued.

- statistical notes, (41) 826.
 stomatal behavior in, (49) 422.
 studies, (49) S.Dak. 527.
 susceptibility to insects, (44) Minn. 753.
 tests, (49) 825.
 urease in seeds, (41) 111.
 varieties for winter grazing crops, (49) Fla. 824.
 varieties, new, description, (46) 531.
 varieties, standardization, (41) 536.
 variety tests, (42) Va. 436, S.Dak. 827; (43) U.S.D.A. 638; (44) Mont. 331, Utah 525, 632, Calif. 731, Va. 732, Oreg. 826, 827; (45) Idaho 223, Ariz. 429, U.S.D.A. 530, 630; (47) Minn. 130, Nebr. 736; (50) 827.
 variety tests, methodology, (48) 333.
 winter resistance, (50) 231.
 yield as affected by seed, (49) 130.
 zinc content, (41) 464.
- Cerebral mycosis, control, (45) 881.
- Cerebrospinal fluid effect of thyroid feeding on pituitrin content, (44) 669.
- Cerebrospinal meningitis, *see* Meningitis.
- Ceresa bubalus, *see* Buffalo treehopper.
- Ceromasia interrupta, notes, (49) 356.
- Ceromasia spheophori, notes, (42) 754; (44) 653.
- Ceroplastes, parasitism, (50) 155.
- Cerosipha n.sp., parasite of, (41) 63.
- Cerotelium dicentrae, notes, (48) 845.
- Cerotelium minutum n.sp., description, (48) 242.
- Cerotoma trifurcata, *see* Bean leaf beetle.
- Cervicitis of swine, (43) 683.
- Cestode hemolysins, (46) 379.
- Cestodes—
 from fishes, (41) 455.
 in house flies, (45) 556.
 of dogs and cats, keys, (43) 80.
 summary, (50) 51.
- Cetoniinae of British India, descriptions, (43) 50.
- Ceuthospora lunata on cranberry, (44) Mass. 848; (45) U.S.D.A. 54.
- Ceutorhynchus—
 assimilis, notes, (47) 551.
 pleurostigma, studies, (47) 556; (50) 57.
 quadridens, studies, (46) 354.
- Chabertia ovina in sheep, (46) 685.
- Chaetexorista pavana, notes, (49) 657.
- Chaetochloa—
 lutescens, bacterial disease, (50) 349.
 revision, (44) 327.
 sp., analyses, (44) Ariz. 568.
- Chaetocnema amazona, notes, (48) 153.
- Chaetocnema spp., notes, (50) 747.
- Chaetodacus spp., descriptions, (43) 57.
- Chaetodacus tryoni in Queensland, (48) 752.
- Chaetodiplodia diversispora, notes, (47) 547.

- Chaetomella sp., notes, (47) 547.
- Chaetomium orientale, notes, (47) 547.
- Chaetopsis aenca on corn, notes, (42) Ohio 852.
- Chaff from Volga region, composition, (50) 169.
- Chaffinch, food habits, (41) 454.
- Chagas disease in Brazil, (43) 182.
- Chagas disease, notes, (43) 57.
- Chaitophorus viminalis, parasite of, (48) 753.
- Chalcid—
 flies, Javanese, (42) 56.
 flies, revision, (47) 660.
 flies, type species, (49) 256.
 fly in clover and alfalfa seed, (43) U.S.D.A. 364.
 fly, new on Australian bulldog ant, (42) 159.
 wasp, structure and development, (50) 356.
 wasps, new species, notes, (42) 159.
- Chalcididae, life history notes, (47) 557.
- Chalcididae, parasites of flies, (42) 361.
- Chalcidids—
 from spruce cones, new, (47) 551.
 injurious to almonds, (45) 454.
 reared from psyllids, summary, (48) 753.
- Chalcidoid flies, revision, (42) 656.
- Chalcidoidea—
 identity of several species, (45) 363.
 new, (41) 63, 463, 667.
 phytophagous, list, (46) 857.
 type species, (49) 256.
- Chalcis—
 calliphorae, notes, (50) 359.
 ovata, notes, (50) U.S.D.A. 258.
 sp., parasitism by, (44) 167.
- Chalk—
 and lime, relative effects, (50) 820.
 ground, for grassland, (41) 826.
 ground, solubility, (49) 512.
 use on Essex soils, (41) 724.
 v. lime, effect on grain, (48) 323.
 v. lime for barley and wheat, (46) 716.
- Chalks, analyses, (49) 512.
- Chamiso—
 as emergency feed for cattle, (45) N.Mex. 573.
 brush, analyses, (43) N.Mex. 374.
 brush, feeding value, (46) N.Mex. 365.
 digestibility and feeding value, (48) N.Mex. 266.
- Chamyris cerintha on privet, (41) Conn. State 159.
- Changa, *see* Mole cricket.
- Chaparral—
 and related communities, ecological study, (49) 822.
 climax formations, (41) 634.
 of southern California, (49) 837.
- Chaparro amargosa, effect on intestinal protozoa of turkey, (45) 484.
- Charaeas graminis, notes, (42) 851.

Charcoal—

- absorption of chlorin by, (42) 709.
- activated ash-free, adsorption of acid dyes by, (49) 505.
- activated sugar, adsorption by, (48) 412.
- artificially dense, production, (45) 613.
- as carbon source for plants, (48) 827.
- burning, (41) 48, 449.
- burning, process, (45) 443.
- for poultry, from walnut shells, (44) 117.
- nature of, (41) 526.
- thermal conductivity, (49) 186.
- use as soil disinfectant, (42) 718.
- use with calcium cyanamid, (41) 723.
- wood for, (41) 449.

Charcoals, adsorptive, decolorizing action, (47) 718.

Chard, canned, bacterial flora, (46) 859.

Chard, fat-soluble vitamin in, (42) 556.

Charips leguminosa n.sp., description, (42) 456.

Charips victrix, hyperparasite of aphids, (46) 463.

Charlock—

- destruction, (47) 824.
- eradication, (46) 37.
- jointed, pods, feeding value, (42) 369.
- seed cake, feeding value, (42) 369.

Chasmodon apterus, parasitism by, (46) 158.

Chataigne wood, durability tests, (43) 44.

Chaulmoogra oil—

- action in leprosy, (46) 579.
- bactericidal action, (42) 777.
- chemistry, (47) U.S.D.A. 241.
- derivatives, preparation, (47) 608.
- effect on tubercle bacilli, (45) 582.
- for tuberculosis treatment, (45) 884.
- plantation, discussion, (49) 143.

Chaulmoogra tree and related species, (47) U.S.D.A. 240.

Chayote—

- culture and uses, (50) U.S.D.A. 139.
- culture directions, (45) 35.
- notes, (41) 538.

Check valve for use with water vacuum pump, (48) 709.

Chee grass, new varieties for South Dakota, (42) S.Dak. 827.

Cheese—

- absorption of fumigating gas by, (47) Calif. 655.
- action of propionic bacteria in, (47) 678.
- American, making on the farm, (45) U.S.D.A. 381.
- American, market standards and grades, (48) U.S.D.A. 480.
- amylase in, (45) 679.
- bacteria in, microscopic study, (46) 177, N.Y.State 479.
- blue-veined, mold of, (42) 876.
- Brie, fungus flora of, (42) 877.
- buttermilk, preparation, (41) 81.

Cheese—Continued.

Camembert, composition, (42) 877.

Camembert, manufacture, (49) U.S.D.A. 878.

Canadian, analyses, (46) 772.

catalse content, (44) 274.

Cheddar, bacteria in, (47) 583; (48) N.Y.State 80.

Cheddar, food value, (41) Ill. 65.

Cheddar, manufacture, (47) 678; (49) 75.

Cheddar, manufacture on the farm, (41) 873.

Cheddar, quality, relation to bacteria, (49) 176.

Cheddar, starters for, (44) Calif. 778.

classification, (48) 773.

cold storage holdings, (49) U.S.D.A. 893.

cold storage reports, (41) U.S.D.A. 66.

composition of original milk, calculation, (41) 805.

control scheme in Ireland, (46) 772.

cottage, food value, (41) Ill. 65.

cottage, increased consumption, (41) U.S.D.A. 680.

cottage, manufacture, (44) Wis. 75.

cottage, manufacture from butter-milk, (42) Ohio 378.

cottage, marketing, (42) U.S.D.A. 173.

cream, cold storage tests, (43) Vt. 179.

curing experiments, (41) Mo. 680.

different kinds, analyses, (46) 276.

Emmenthal, eye formation, (41) 873.

factories, accounting systems, (44) Wis. 474; (45) 293.

factories, cooperative, in England, (41) 776.

factory, establishment, (49) 277.

from buffalo milk, (41) 680.

from milk of fruit-fed cows, (46) 276.

from pasteurized milk, remedy for lack of flavor, (44) Wis. 274.

from skim milk, (42) 269.

fruity flavors in, (45) 779.

gas formation in, (44) 75; (45) 73.

Gouda, from pasteurized milk, (47) 80.

Grana, microbial flora of whey, (44) 273.

hard, rind cancer, (47) 678.

Herrgård. studies, (42) 774.

imports and exports, (43) 74.

imports into Great Britain, (46) 276.

imports into United Kingdom, statistics, (42) 774.

industry, changes in, (42) U.S.D.A. 378.

infection with tubercle bacilli, (42) 179.

international trade, (46) 675.

large-holed and small-holed types, (44) 75.

making, (41) 797; (43) 580.

making, effect of calcium in milk, (50) 378.

Cheese—Continued.

- making, experiments, (42) Calif. 876 ; (46) 275, 680 ; (47) Okla. 878.
- making from pasteurized milk, (42) 565.
- making in France, (44) 891.
- making in Great Britain, (43) 682.
- making in Netherlands, treatise, (44) 372.
- making, manual, (46) 275.
- making, neutralization of milk for, (45) 778.
- making on the farm, (43) 272 ; (47) 785 ; (48) 276.
- making on the farm, starters for, (45) 577.
- making, pasteurization in, (43) 179.
- making, pasteurization of milk for, (50) 679.
- making, *Penicillium* culture for, (41) 80.
- making, pepsin v. rennet, (44) 274.
- making plants, plans and equipment, (41) 184.
- making, practical, handbook, (42) 270.
- making, pure culture starter, (44) 874.
- making, rennet substitutes in, (42) 566.
- making, rôle of bacteria in, (42) 564.
- making, treatise, (42) 269.
- making with clarified milk, (49) N.Y. Cornell 475.
- making with lactic acid bacteria, (43) 681 ; (45) 476.
- marketing, cooperative, (45) 493 ; (48) Wis. 789.
- mites, control, Calif. (47) 655 ; (48) 252.
- Neufchâtel, cold storage tests, (43) Vt. 179.
- of Spanish ewes, (49) 75.
- pink discoloration of, (44) 372.
- poisoning organisms, (41) 169, 170.
- production and international trade, (41) U.S.D.A. 892.
- production and prices, (43) 74.
- production and trade, (49) 376.
- production during the war, (41) 473.
- production in Ontario, (49) 176.
- rind rot, cause, (43) 179.
- ripening, (49) 176.
- ripening, bacteriological studies, (48) N.Y.State 80.
- ripening, relation to bacteria in milk, (45) N.Y.State 476.
- Roquefort, manufacture, (45) U.S.D.A. 679.
- schools, cooperative, in England, (41) 776.
- selection and use, (45) 260.
- skippers, control, Calif. (47) 655 ; (48) 252.
- soft, cold storage tests, (43) Vt. 178.
- soft, manufacture, (42) 270.
- soft, manufacture and marketing, (44) Wis. 75.

Cheese—Continued.

- Swedish, studies, (42) 774.
- Swiss, cause of eyes and flavor, (45) 779.
- Swiss, eye-forming culture, (49) Wis. 679.
- Swiss, making, bacterial cultures in, (46) 772.
- Swiss, manufacture, methods, (44) 874 ; (49) Wis. 679.
- Swiss, manufacture, occurrence of glass cheese in, (47) 283.
- Swiss, production in Sweden, (49) 75.
- Swiss, stinker, cause, (49) Wis. 679.
- testing for fat, (45) 780.
- trade, world's, since 1913, (45) U.S.D.A. 89.
- water content as affected by fat, (44) 75.
- whey, Swiss, heat coagulation, reaction for, (45) 803.
- yields, calculating, (46) 879.
- Cheiranthus cheiri*, anatomy of polycotylous seedlings, (42) 725.
- Chelidonium majus*, inheritance of doubleness, (41) 223.
- Chelonia caja*, absence of complement in blood, (41) 754.
- Chelonus (Chelonella) proteus* n.sp. description, (41) 63.
- Chemical—
 - agents, effect on oxidation of soil forming rocks, (49) 617.
 - analysis, manual, (47) 108, 805.
 - analysis, qualitative, treatise, (46) 111.
 - analysis, standard methods, treatise, (47) 108, 801.
 - analysis, treatise, (48) 312 ; (49) 110.
 - and physical terms, English-French-German dictionary, (48) 314.
 - compounds, disinfecting power, (43) 78.
 - constitution and physiological action, relation, (47) 203.
 - engineering, processes in, (50) 612.
 - French, (45) 108.
 - industries, inorganic, progress in Germany, (42) 724.
 - literature, art of searching, (41) 613.
 - preparations, handbook, (41) 613 ; (49) 608.
 - raw materials from plant products, (50) 608.
 - solubilities, inorganic, dictionary, (45) 410.
 - structure and physiological action, (46) 202.
 - technology, treatise, (49) 608.
 - terms, dictionary, (44) 801.
- Chemical-technical analysis, treatise, (48) 312 ; (49) 110.
- Chemicals—
 - as repellents, attractants, and larvicides, tests, (49) 356.
 - effect on oviposition of house fly, (47) 56.
 - effect on wood distillation, (47) 208.

Chemicals—Continued.

- organic medicinal, treatise, (45) 278.
- tested at the Bureau of Chemistry, (42) 205.

Chemistry—

- agricultural, laboratory manuals, (44) 296.
- agricultural, official methods of analysis, (44) 9; (47) 204.
- agricultural, present-day problems, (42) 201.
- agricultural, textbook, (43) 10, 898.
- agricultural, treatise, (41) 501.
- agricultural, yearbook, (45) 410; (47) 201; (49) 407.
- analytical, treatise, (43) 10; (46) 310.
- and physics, handbook, (45) 801.
- and the food industry, (45) 108.
- animal, progress in, (42) 310.
- applied analytical, manual, (41) 710.
- applied, differential equations in, (50) 709.
- applied, handbook, (45) 201.
- applied, progress, (49) 608.
- applied, textbook, (49) 801.
- biological, treatise, (41) 407; (45) 801.
- calendar, (45) 410; (47) 201; (49) 110.
- clinical, laboratory manual, (46) 201.
- college instruction in, criticism, (42) 201.
- colloid, *see* Colloid chemistry.
- dictionary, (45) 108; (47) 801.
- dictionary, condensed, (41) 613.
- elementary agricultural, textbook, (41) 896.
- fat, (48) 107.
- fat, progress in, (43) 201; (45) 203.
- fat, review of literature, (43) 112.
- for engineers and manufacturers, treatise, (46) 778.
- history of, treatise, (48) 801.
- horticultural, treatise, (50) 201.
- household, laboratory outline, (46) 296.
- in cereal industries, phases, (50) 710.
- in control of plant enemies, (50) 710.
- industrial and agricultural, in British Guiana, (41) 501.
- industrial and agricultural, in British West Indies, (45) 310.
- industrial, manual, (43) 609.
- industrial organic, treatise, (44) 409; (48) 801; (50) 801.
- inorganic, treatise, (43) 609; (44) 409.
- international catalogue, (41) 501.
- medical, treatise, (43) 609.
- of building and machine material, (43) 389.
- of condiments, (43) 609; (48) 411.
- of flour milling, (44) 168.
- of food and human nutrition, (46) 355.
- of foods, (43) 409, 563, 609; (48) 411.

Chemistry—Continued.

- of humin acids, (43) 321.
 - of leather, treatise, (43) 317, 617.
 - of nutrition, (46) 255.
 - of plant life, (45) 501.
 - of soils, (43) 122.
 - of starch and cellulose, (42) 409.
 - of wood, (43) 409, 617.
 - organic, (45) 201.
 - organic and biological, textbook, (49) 801.
 - organic, catalysis in, (47) 501.
 - organic, catalysis in, treatise, (48) 411.
 - organic, handbook, (42) 310.
 - organic, laboratory manual, (49) 501.
 - organic, methods, (46) 9; (49) 110.
 - organic, textbook, (44) 409.
 - organic, treatises, (45) 310, 713.
 - pharmaceutical organic, treatise, (46) 202.
 - physiological, textbook, (45) 261.
 - physiological, treatise, (44) 556, 610; (46) 859; (47) 501.
 - progress, (41) 10, 201, 613; (43) 409; (45) 610; (47) 9, 201; (49) 608.
 - publications, (44) 501.
 - reading courses in, (43) 801.
 - relation to livestock industry, (50) 608.
 - relation to national defense, (50) 196.
 - research in, relation to medicine, (47) 501.
 - textbook, (43) 697; (47) 696.
 - vocational, treatise, (46) 95.
 - yearbook, (42) 310; (43) 201; (44) 501; (45) 108; (46) 9; (49) 202.
- Chemists, college trained, examination for Government service, (42) 201.
- Chemotherapy and plant pathology, (49) 839.
- Chemotherapy of organic arsenicals, (47) 283.
- Chemotropism of mosquitoes, (47) N.J. 553.
- Chenopodium—
- effect on hookworms, (45) 287.
 - fluid extract v. oil, ascaricidal value, (43) 381.
 - oil, anthelmintic value, (41) 480, 782; (46) 686; (49) 77.
 - oil, ascaricidal value, (43) 381; (45) Okla. 478.
 - oil, ascaridole determination in, (46) 311.
 - oil, composition, (43) 502.
 - oil for intestinal roundworms in poultry, (42) Calif. 886.
 - oil in capsules, ascaricidal efficacy, (42) 180.
 - oil, methods of administering, (49) 788.
 - oil, value against chicken nematode, (50) Minn. 152.
- Chenopodium quinoa—
- culture experiments, (41) 733.
 - seeds, feeding value, (42) 369.
- Cherimoya for California, (42) 42.

Cherimoya, native home, (46) 842.

Cherimoyas, analyses, (47) Calif. 660.

Chermes—

abietis, notes, (50) Conn.State 50.

cooleyi in England, (46) 53.

cooleyi, life history, (50) 556.

cooleyi, notes, (46) 558.

larch, life history, (43) 54.

life histories, (42) 851.

pinicorticis, natural control, (50) 844.

pinicorticis, notes, (43) Conn.State 251.

Chermidae, new genera and species, keys, (43) 450.

Cherries—

as affected by chloropicrin, (45) 28.

black, new variety, (42) 637.

breeding, (47) Minn. 338.

breeding experiments, (43) 742; (44)

145, Oreg. 833, Oreg. 836; (50) Can. 36.

clover mite on, (44) Calif. 752.

composition as affected by fertilizers, (46) 736.

culture, (43) Nebr. 644.

culture experiments, (44) Alaska 336;

(47) Alaska 534, Wis. 745; (49) Alaska 435.

culture in Asia, (45) 45.

diseases affecting, (44) Calif. 744.

dried, antiscorbutic value, (47) 62.

dropped, studies, (48) Del. 634.

drying, Calif. (45) 808; (48) 506, 507.

effect of temperature on resistance to wounding, (43) U.S.D.A. 39.

fertilizer experiments, (42) Wis. 342; (44) N.Y.State 534.

flower bud formation date, (48) 443.

freezing temperature for buds, (44) 740.

frost resistant varieties, (45) 346.

girdling experiments, (48) Calif. 534.

hardiness studies, (45) N.Dak. 236.

hardy variety, (43) Minn. 833.

harvesting and handling for shipment, (47) Calif. 239.

insects affecting, (44) Mo. 754; (45) 853.

Monilia cinerea on, specialization, (47) 844.

new or noteworthy, (49) N.Y.State 338.

origin and characteristics, (43) 744.

pollination experiments, (44) Calif. 737; (47) 833.

pollination studies, (42) 534, Calif. 832; (45) Idaho 235; (47) Wis. 746; (48) Oreg. 238, Calif. 535; (49) Oreg. 532, Oreg. 534; (50) 442.

preserving, (45) 665.

pruning experiments, (42) Calif. 139, (47) Wis. 745; (48) Mich. 536;

(49) N.Y.Cornell 638.

root development, (48) 736.

Cherries—Continued.

self-sterility and cross-incompatibility in, (49) 234.

self-sterility in, cause, (48) 444.

size as affected by alkaline sprays, (50) 751.

sour, culture, (47) Colo. 439.

sour, culture at high altitudes, (44) Colo. 234.

sour, fertilizer experiments, (49) Mich. 438.

sour, insects affecting, (43) 352.

sour, pruning, (42) Wis. 343.

sour, time for transplanting, (43) Mo. 142.

spacing experiments, (47) Calif. 638.

spray residue on, (47) U.S.D.A. 360.

spray schedule, (42) Ark. 736, Wash.

836; (43) N.J. 37; (44) Mo. 535;

(47) N.J. 140, Ohio 140; (49) N.J. 138.

spraying and dusting, (44) Mich. 144.

sterility investigations, (45) Wis. 236.

stocks for, (42) Calif. 833; (44) 145.

storage studies, (44) Calif. 738; (46) 338.

storage temperature, (47) Calif. 640.

storage temperature, effect on fungus

diseases, (47) 151.

sun drying, (43) 808.

sweet and sour, differences of Monilia on, (45) 53.

time of fruit bud differentiation, (49) 834.

transportation rot, relation to spraying, (47) 152.

variability in fruit and leaves, (50) 429.

varieties for cultivation, (45) 139.

varieties for Delaware, (44) Del. 440.

variety tests, (41) Del. 145; (50) Can. 440.

wild black, in northern Pennsylvania, (50) 242.

wild, of tropical America, (47) 833.

wild, poisonous to stock, control, (42) 879.

winter injury, (41) 53; (43) U.S.D.A. 435.

winter study, (46) 839.

Cherry—

aphid, control, (47) Idaho 759.

aphid, importance, (47) Wis. 452.

bacterial gummosis, (49) 845.

bacterial leaf spot, notes, (43) Okla. 36.

beverage, preparation, (49) Calif. 412.

black knot, control, (42) 353.

blossom blight, notes, (49) 44.

blossom buds, development and winter injury, (47) Wis. 820.

brown rot, control, (41) 348; (42) 544; (45) 450.

brown rot, notes, (43) 349.

buds, analyses, (45) Mo. 221.

curculio, control, (43) 352.

Cherry—Continued.

- die-back, notes, (44) 49.
- diseases, (48) Can. 144.
- diseases and pests, remedies, (45) Wash. 44.
- diseases, control, (43) Ill. 847; (44) Wash. 53.
- diseases, parasitic, 1915-1920, (49) 445.
- foliage, injury from sprays, (47) Mass. 646.
- fruit buds, winter injury, (42) Wis. 342.
- fruit fly, control, (50) 844.
- fruit fly, summary, (46) 57; (49) Oreg. 156.
- fruit sawfly, control, (47) Calif. 654.
- gummosis, (47) 249, Calif. 649.
- leaf miner, life history and control, (42) 650.
- leaf scorch, notes, (43) 246; (44) 346; (46) 741; (49) 45.
- leaf spot, control, (41) U.S.D.A. 348; (43) 352; (44) Wis. 241; (45) Wis. 243; (47) Wis. 446, Mich. 450; (48) S.C. 646.
- leaf spot, life history, (45) Mich. 450.
- leaf spot, notes, (42) N.Y.State 350; (44) Calif. 744, Oreg. 840; (45) 541; (48) N.J. 345; (49) 445, Wis. 644.
- leaf spot, overwintering, (41) 450.
- Monilia, (42) 150.
- Monilia, cause, (47) 749.
- Monilia, specialization in, (46) 48.
- orchard survey, (43) Colo. 144.
- orchards, defoliated, care, (48) Mich. 342.
- orchards, fertilization, N.Y.State (49) 534, 535.
- ornamental, for Minnesota, (41) 148.
- roots, resistance to freezing, (44) N.Y.Cornell 820.
- rootstock, identification, (49) Calif. 637.
- sand, of North Dakota, (41) 836.
- sawfly, control, (44) S.Dak. 555; (47) 257, 557; (48) Calif. 551.
- sawfly in Japan, (42) 159.
- sawfly, studies, (42) S.Dak. 850.
- shot hole, control, (41) 450; (43) 155.
- shot hole, notes, (45) 541.
- silver-leaf, notes, (49) 845.
- slug, control, (43) 352.
- slug, notes, (45) Conn.State 149.
- slug sawfly, parthenogenesis, (43) 60.
- stock, studies, (49) N.Y.State 38.
- thrips, dusting for, (44) Calif. 752.
- Wragg, bacterial disease, (49) Colo. 445.
- yellow leaf, notes, (49) 442.

Cheshunt Compound, preparation, (50) 352.

Chestnut—

- bark disease, history, (43) 658.
- black canker, cause, (47) 548.
- black canker, studies, (41) 49; (42) 747; (43) 448; (44) 545; (48) 850.

Chestnut—Continued.

- blight, developing immunity to, (44) 156.
 - blight, injections as remedy, (45) 549.
 - blight resistance, (46) 150; (48) 746.
 - coppice, dendrometrical table for, (42) 739.
 - disease, new to California, (48) 352.
 - flour, characteristics and detection, (41) 467.
 - hybrids, (48) 738.
 - ink malady, (48) 747.
 - tuberosities, (43) 753.
 - weevil, control, (47) Ohio 359.
 - white, ashes, analyses, (43) 324.
- Chestnuts—
- absorption of hydrocyanic acid by, (49) U.S.D.A. 457.
 - European varieties, classification, (43) 41.
 - French, diseases, (48) 747.
 - horse, *see* Horse-chestnuts.
 - infestation by *Carpocapsa splendana*, (50) 661.
 - injection of chemicals into, (44) 326.
 - monograph, (49) 837.
 - oak *Oidium* on, (48) 352.
 - pathological xylem, production, (44) 544.
 - replacement of, (46) 445.
 - restoration, (49) 440.
 - Spanish, analyses, (41) N.Y.State 868.
 - sweet, culture experiments, (50) Minn. 138.
 - time for transplanting, (43) Mo. 142.
 - vitamin content, water-soluble, (44) 461.
 - Xenia in, (45) 629.
- Cheyletus eruditus*, notes, (41) 463.
- Chia seed oil, (45) 613.
- "Chiai" flesh, chemistry of, (43) 563.
- Chiasmotype and linkage, (43) 269.
- Chicago Board of Trade, functions, (45) 694.
- Chick—
- embryo, duplicity in, (42) 866.
 - embryo, effect of abnormal temperatures on nervous system, (42) 669.
 - embryo, glycogen in, (42) 669.
 - embryology, treatise, (42) 562.
 - embryos, testis and ovary grafts on, effects, (45) 371.
 - skeleton, source of calcium, (42) 768.
- Chicken—
- canker in New Jersey, (41) N.J. 881.
 - canker, vaccine for, (44) N.J. 378.
 - cholera, studies, (49) 182.
 - depluming mite, eradication, (42) 253.
 - disease, toxic anaerobe from, (49) 382.
 - gapes, (41) W.Va. 88.
 - lice and mites, control, (47) Ohio 685.
 - lice, control by naphthalene, (42) 252.
 - lice powders, tests, (44) U.S.D.A. 161.
 - lice, remedies, (41) 662.
 - mite, notes, (43) Okla. 51.

Chicken—Continued.

- muscle, diamino acid content, (47) 610.
 nematode, control, (50) Minn. 152.
 nematode, life history and control, (44) Minn. 753.
 nematodes, studies, (46) 84; (47) Minn. 356.
 pest, studies, (45) 483.
 pox and cowpox, relationship, (49) 379.
 pox and roup, control, (50) 586, 685.
 pox, control, (47) 283; (49) 178, 183.
 pox, control, campaign for, (45) N.J. 286.
 pox, diagnosis, therapeutics, and prophylaxis, (44) 881.
 pox, immunization, (42) Calif. 886, Wash. 886; (44) Calif. 782; (48) Calif. 585; (50) 879.
 pox in New Jersey, (41) N.J. 881.
 pox, popular account, (44) N.J. 378.
 pox, summary, (47) Mich. 186.
 pox, syringe for control, (44) Wash. 683.
 pox, treatment, (44) Hawaii 83.
 pox vaccine, preparation, (45) Ind. 177.
 pox vaccine, preparation and administration, (47) Calif. 685.
 pox vaccine, value, (46) 485.
 pox virus, relation to avian diphtheria, (44) 183.
 recipes for cooking, (42) U.S.D.A. 254.
 sarcoma, heterolysins in (41) 874.
 serum, antipneumococcus substances in, (45) 681; (46) 775.
 serum, normal and immune hemagglutinins in, (49) 879.
 skin, digestibility, (43) 164.
 sticktight flea, Okla. (42) 252; (43) 587.
 tapeworm, studies, (44) Kans. 281.
 Chickens—*see also* Chicks, Fowls, Hens, Poultry, *etc.*
 as affected by rose chafers, (49) Conn.Storrs 56.
 Bantam breed, standard varieties, (46) U.S.D.A. 769.
 black locust poisoning, (46) 686.
 body temperature of breeds, (46) 769.
 botulism in, (43) 84.
 brooders for, (41) Mont. 90.
 calcium metabolism, (43) N.Y.State 574.
 Columbian Plymouth Rock, history, (47) 378.
 contagious epithelioma, (43) Nev. 272.
 crate fattening, (50) Can. 472.
 crossing-over of sex-linked genes, (48) 565.
 digestion and nitrogen-balance trials, (46) 173.
 digestive organs of, (43) Wash. 689.
 effect of carotinoid free rations, (44) 69.

Chickens—Continued.

- effect of certain grain rations, (41) 75.
 fattening, economic factors, (50) 274.
 fattening experiment in elementary school, (44) 596.
 fattening, results in, (49) 673.
 function of grit in gizzard, (47) 576.
 growing in confinement, (50) 372.
 growth rate, (45) 775.
 hereditary relation of dominant white and blue, (50) 330.
 infection with gapeworms, (45) U.S.D.A. 78.
 leg weakness in, (45) 171; (47) Mich. 697, 871.
 management on Texas farms, (45) Tex. 71.
 mineral supplements for, (47) 175.
 natural and artificial brooding, (50) U.S.D.A. 780.
 removal of heterakids from ceca, (49) 183.
 Rhode Island Reds, growth rate, (46) 768.
 rose chafer poisoning, (44) 379.
 selection for egg characters, (43) N.Y.Cornell 872.
 spontaneous disease of, (49) 684.
 standard varieties, U.S.D.A. (41) 676; (46) 172; (50) 72.
 susceptibility to snakeroot poisoning, (50) Ind. 181.
 vitamin A requirement, (47) 169.
 vitamin deficiency studies, (47) Iowa 772.
 wheat and corn as sole rations for, (41) 772.
 xanthophyll feeding, effect on pigmentation, (44) 70.
 Chick-pea disease, (49) 45.
 Chick-peas—
 as hay crop, (48) N.Dak. 226.
 composition, (41) 408.
 culture experiments, (45) Kans. 33.
 culture in Alaska, (41) Alaska 31.
 description and agricultural value, (43) 528.
 field tests, (41) N.Dak. 824.
 Chicks—
 brooding, (49) N.J. 273.
 brooding and rearing, (48) 476.
 cabbage as vitamin source for, (46) Kans. 478.
 care and management, (47) Mont. 476.
 care of, (42) U.S.D.A. 562, N.J. 885; (44) U.S.D.A. 73.
 causal factor in hatching, (43) 169.
 cause of losses, (47) West.Wash. 476.
 cost of raising, (48) Mo. 666; (50) Can. 373.
 crossbred, determining sex at birth, (49) 165.
 day-old, grain as sole feed, (46) Kans. 478.
 diseases of, (50) Mo. 884.

Chicks—Continued.

effect of proteins on nutrition, (49) 172.
 effect of supplementary feeds on growth, (45) Mo. 273.
 feeding, (43) Mo. 174; (47) Md. 73, Ohio, 196, 377, Iowa 780.
 feeding and health, (46) Wash. 498.
 feeding and management, (49) West. Wash. 71.
 feeding charts and other suggestions, (42) 694.
 feeding eggs to, (49) Wis. 672.
 feeding experiments, (43) N.C. 467, 573; (45) Can. 876; (46) Mo. 370, Guam 764; (49) Can. 70.
 feeding methods, (50) Can. 777.
 growing, effect of ration on later egg production, (48) 476; (50) W.Va. 71.
 growing, management, (42) U.S.D.A. 170.
 growing, vitamin requirements, (49) 673.
 growth as affected by feed, (43) Ky. 72.
 growth rate, (43) 675.
 hatching as affected by moisture, (44) Oreg. 871.
 hatching, management of incubators, (44) N.J. 871.
 initial weight, effect on growth and mortality, (49) Ind. 573.
 intestinal disorders, green feed v. anti-septics for, (45) Ind. 172.
 leg weakness in, (50) West.Wash. 576.
 Leghorn, cost of raising, (45) Idaho 273.
 management, (44) U.S.D.A. 270.
 meat v. soy bean as corn supplement, (42) 670.
 micrococcus infection of, (45) 79.
 milk products for, (45) N.J. 378.
 minerals for, (50) 872.
 mortality, causes, (47) 589.
 newly hatched, temperature, (46) 769.
 nitrogen elimination on meat scrap and soy bean meal, (42) 670.
 nutrient requirements, (45) Nebr. 576; (46) 171; (47) Nebr. 781, 871; (49) Nebr. 777; (50) 780.
 raising, (48) N.J. 667, 873.
 rations for, (49) Iowa 777.
 sex determination at hatching time, (47) 378.
 soy bean meal for, (43) 674.
 synthetic ration for, (45) 171.
 teaching to roost, (49) West.Wash. 373.
 visual perception of, (49) 273.
 vitamin requirements, (42) Wis. 375; (50) 373.
 weed seeds for, (44) Kans. 270.
 weight at hatching, relation to egg weight, (47) 672.
 white diarrhea in, effect of artificial incubation, (42) Minn. 886.

Chicks—Continued.

young, distinguishing sex, (49) Conn. Storrs 776.
 Chicle, origin, (41) 653.
 Chico, vitamin C in, (49) 563.
 Chicory—
 coffees, analyses, (46) 416.
 control and uses, (44) U.S.D.A. 35.
 culture experiments, (41) 229.
 duplication and cohesion in main axis, (41) 223.
 forcing studies, (49) Ill. 336.
 inulin in, (42) 226.
 Chiggers—*see also* Trombidium spp.
 life history and control, (46) U.S.D.A. 255.
 North American, distribution and nomenclature, (50) 762.
 Chil, yield tables, (43) 840.
 Chilacayote, value as human food, (45) 135.
 Child—
 care and maternity in rural Mississippi, (45) 135.
 care and nursing in the home, (50) 395.
 care, college course on, (49) 492.
 care, teaching to seventh grade girls, (50) 695.
 care work in rural communities, (41) 890.
 labor in beet fields, (49) 795.
 labor in North Dakota, (50) 493.
 labor, national conference on, (47) 193.
 labor, rural, (47) 193.
 labor, rural, extent and control, (48) 792, 896.
 obese, metabolism of, (44) 566.
 welfare, educational tours, (44) 495.
 welfare in West Virginia, (50) 194.
 welfare teaching in rural communities, (43) 694.
 welfare work, food selection in, (48) 61.
 welfare work of Saskatchewan, (48) 61.
 Children—*see also* Boys and Girls.
 backward, effect of improved feeding, (50) 855.
 backward, effect of vitamin rich diet, (46) 868.
 basal metabolism, (45) 561.
 basal metabolism, standards, (46) 261.
 budget and accounts for, lesson plans, (41) 494.
 calcium absorption on low fat diet, (49) 457.
 calcium and phosphorus metabolism in, (48) 463.
 calcium distribution in blood, (46) 259.
 calcium in blood of, (45) 63.
 calcium metabolism of, (42) 661.
 correct diet for, (45) 63.
 country, high school opportunity for, (48) 896.

Children—Continued.

- creatin-creatinin excretion in, (48) 861.
 energy expenditure and food requirements, (49) 762.
 energy requirements, (43) 166.
 farmers', schools for, (47) 298.
 fat metabolism of, (42) 60.
 fecal flora, bacteriological study, (46) 571.
 feeding in Germany, (48) 160.
 food for, (49) 56.
 food requirements, (42) 658; (45) 162; (47) 766; (48) 654.
 four-year-old, menus for a week, (50) 161.
 growth and nutrition, (48) 654.
 health books for, (46) 194, 898.
 heights and weights, statistical study, (47) 561.
 inorganic phosphorus in blood, (49) 764.
 malnourished, classes for, (44) 666.
 malnourished, health education for, (44) 860.
 malnourished, means of determining, (50) 854.
 malnourished, nutrition clinics for, (43) 167.
 malnourished, value of extra milk ration, (50) 855.
 malnutrition in, (42) 864.
 nutrition, indices, (47) 166.
 nutrition of, treatise, (47) 766.
 nutritional disorders, (42) 165.
 phosphoric acid distribution in blood, (46) 259.
 physical growth, (49) 662.
 protein requirements, (46) 756.
 pulmonary symptoms, relation to Ascaris, (43) 80.
 rural, handicaps, (48) 599.
 rural, nutrition of, (44) 393.
 subcutaneous parasite of, (48) 157.
 underweight, basal metabolism, (47) 63.
 underweight, effect of adding orange juice to diet, (49) 662.
 underweight, value of milk and oranges to, (50) 563.
 vitamin requirements, (48) 360.
 weight and height as nutrition index, (49) 257.
 with anorexia, gastric findings in, (48) 362.
- Children's gardens, *see* School gardening.
 Children's teeth, nature and health of, (44) 666.
- Chili—
 anthracnose, studies, (44) 445.
 blossom and twig rot, (44) 445.
 collar rot, notes, (50) 244.
 die-back, control, (44) 445, 446.
 die-back, studies, (46) 743.
 disease, new, notes, (44) 446; (45) 447.
 disease survey in India, (46) 544.
 seed oil, composition, (45) 720.

Chilies, fungi attacking, (45) 444.

Chilo—

- plejadellus, notes, (43) U.S.D.A. 253.
 simplex, control, (46) 458.
 simplex, notes, (47) 357.
 spp., notes, (45) 359.
 suppressalis on rice, (44) 250.
 Chilomastix mesnili, notes, (49) 477.
 Chilomastix mesnili of man, carriage by flies, (45) 556.
 Chilopods of Pribilof Islands, (49) U.S.D.A. 652.

Chimneys—

- construction, (44) 689; (46) U.S.D.A. 386; (47) 293.
 design, formulas for determination of wind pressure, (49) 388.
 for house heating boilers, (46) 692.

Chinch bug—

- barriers for, (43) Ohio 758; (50) 53.
 bionomics, (46) U.S.D.A. 658.
 control, (44) 451; (45) Kans. 360, 553, 852; (47) U.S.D.A. 361; (48) Mich. 53, Ill. 458; (49) Ill. 431, Ill. 450.
 control in Illinois, (41) 59, 60.
 corn varieties resistant to, (45) 152.
 creosote barrier line for, (47) Ind. 156.
 false, notes, (41) Mont. 57.
 in Indiana, (46) 53.
 in Massachusetts, (44) 251.
 in Montana, (43) 758.
 method of study, (46) 245.
 notes, (46) Ohio 351; (47) 848; (48) U.S.D.A. 52, 650; (49) Iowa 757.
 summary of information, (49) S.Dak. 654.

Chinese—

- banana, vitamin C in, (49) 563.
 fish pond mud, composition, (50) 319.
 petsai as a salad, (41) 66.
 vegetable tallow, culture experiments, (47) Calif. 631.
 white wax scale, studies, (49) 355.

Chinin, synonymous with coyo, (42) 537.

Chinook winds in United States, (49) 808.

Chionaspis—

- euonymi, *see* Euonymus scale.
 furfura, *see* Scurfy scale.
 pinifoliae, notes, (47) Conn.State 156; (49) 50.
 salicis-nigrae in South Dakota, (41) 59.

Chipmunk, habits, (48) 549.

Chipmunk, new, (44) 849.

Chir forests, effect of fires on, (41) 840.

Chir, insects affecting, (42) 357.

Chironomidae of Belgium, (50) 358.

Chironomus cristatus, life history, (50) 455.

Chloral hydrate soil treatment, effect on pine seedlings, (45) 549.

Chloramins, detection in milk and cream, (48) U.S.D.A. 12.

Chloramin-T—*see also* Dakin's solution, Dichloramin-T, and Hypochlorate.

Chloramin-T—Continued.

action of, experimental study, (42) 174.

germicidal value, (44) 476, 680.

Chlorate, estimation in saltpeter, (41) 803.

Chloreton for administration of bacterial vaccines, (44) 578.

Chloreton, properties, (42) 8.

Chlorid metabolism, (44) 465.

Chloridea—

assulta, notes, (45) 551.

obsoleta, *see* Cotton bollworm and Corn earworm.

spp., structure and coloration of larvae, (44) Ky. 550.

Chlorideae of Argentina, (43) 731.

Chlorids—

absorption by soils, (42) Calif. 811.

and sulphates, comparison, (45) 521.

determination in blood, (44) 506, 614;

(45) 414, 415.

determination in chemical reagents, (41) 799.

effect on plant growth, (42) 335.

effect on starch, (47) 128.

in blood, determination, (45) 15.

in blood plasma, determination, (50) 615.

in human milk, (45) 764.

in soil, determination, (43) 311.

in water, effect on cereals, (45) 586.

Chlorin—

absorption by charcoal, (42) 709.

action on plants, (45) 28.

bleaching, effect on flour, (48) 806.

conversion into hydrochloric acid, (43) 712.

determination, (41) 312.

determination in blood, (42) 712.

determination in organs and foods, (48) 807.

determination in solid tissues, (45) 414.

determination in sugar cane, (41) 736.

determination, method, (42) 611.

disinfectants, germicidal value, (44) 476.

disinfection for water supplies, (42) 575, 682.

effect on oats, (41) 724.

effect on plants, (50) 428.

excretion as affected by potassium feeding, (49) 464.

factor of pulp, determination, (47) 207.

germicidal action, (50) 679.

in animal tissues, (44) 713.

in blood after salt ingestion, (46) 174.

in cows' and goats' milk, (47) 367.

in human milk, racial variations, (50) 562.

in organic matter, determination, (42) 711; (46) 311.

in soils, (45) 818.

in sugar beets, (45) 317.

Chlorin—Continued.

index and nitrogen content of soil, relation, (48) 516.

loss from soil by drainage, (43) 19.

official method, modification, (42) 506.

removal from soil by drainage, (47) Ky. 122.

use for retarding flowering of fruit trees, (42) 534.

Chlorinated eucalyptol, description, (41) 781.

Chlorinated soda solutions, monograph, (41) 781.

Chlorion cyanium, notes, (47) S.Dak. 451.

Chloris gayana, history, culture, and analyses, (41) U.S.D.A. 337.

Chlorita lybica n.sp., description, (47) 850.

Chlorochroa (Pentatoma) sayi, studies, (41) U.S.D.A. 355.

Chlorodinitrobenzene, effect on plants, (46) 544.

Chloroform—

and water, distribution of drugs between, (47) 15.

as anthelmintic, (41) 782.

ascaricidal value, (45) Okla. 478.

effect on catalase production, (42) 259.

effect on hookworms, (45) 285; (46) 184, 185.

iodized in war surgery, (41) 83.

Chlorophol, fungicidal value, (49) 645.

Chlorophorus strobilicola n.sp., notes, (42) 158.

Chlorophyll—

abnormalities of corn, (45) 524.

action of light waves of different lengths on, (45) 31.

aldehyde production, (41) 133.

assimilation, relation to red pigment in algae, (47) 127.

colloidal, action of light on, (46) 825.

development in juniper seed, (48) 525.

development, relation to sulphur in soil, (49) 420.

development, time required, (45) 31.

factors in *Allium cepa*, mendelizing, (47) 822.

fluorescence in cells, (45) 628.

formation by algae in darkness, (46) 724.

formation, effect of pyrrolic nucleus, (44) 132.

free plants, vitamin B in, (48) 162.

in plants, (48) 431.

in plants, changes affecting, (43) 526.

in plants in Alps and lowlands, (44) 132.

in plastids, condition, (50) 126.

in yellow-striped sugar cane, (44) 846.

photo-electric properties, (49) 519.

production in plants intermittently illuminated, (44) 824.

relation to urochrome, (47) 65.

rôle in respiration, (42) 433.

rôle in sugar production in plants, (42) 527, 627.

Chlorophyll—Continued.

- studies, (41) 10.
- treatise, (41) 525.
- types of corn, cytology of, (49) 423.

Chloropicrin—

- action on *Argas reflexus*, (46) 465.
- action on grain pests, (45) 455.
- action on plants, (44) 825; (45) 28; (46) 544.
- effect of temperature on insecticidal value, (43) 157.
- effect on seeds, (45) 537; (47) 222, 542.
- experiments, results, (45) 454.
- for cotton seed fumigation, (49) 154.
- for horse mange treatment, (43) 184.
- insecticidal value, (44) U.S.D.A. 56; (45) 656, 756; (46) 852.
- toxicity to insects, (41) 456.
- use against termites, (46) 656.
- use on stored grain pests and rats, (44) 754.

Chloropicrination, use of term, (43) 184.

Chloroplasts, size of, (45) 628.

Chlorosis—

- constitutional, in plants, (42) 350.
- effect on composition of fruit, (50) 248.
- in fruit trees, (42) 48.
- in trees, remedies, (42) 647.
- of conifers, control, (45) 250.
- of cottonwood trees, (49) N.Mex. 548.

Chlorotetracetyl fructose and derivatives, (44) 309.

Choanephora cucurbitarum, notes, (44) 445, 446; (45) 48, N.C. 443.

Choanephora cucurbitarum on chilies, (42) 145; (45) 447.

Choanotaenia infundibuliformis, notes, (50) 82.

Choanotaenia infundibuliformis, transmission, (41) 881.

Chocolate—

- and its adulteration, (41) 467.
- determination of fat in, (41) 714.
- industry, (45) 643.
- milk, determination of milk content, (49) 204.
- milk, examination and evaluation, (49) 204.

Chocolates, analyses, (42) 162.

Choetostylum fresenii in cold storage meat, (48) 258.

Chokecherry, wild, poisonous to livestock, (43) Nev. 273.

Cholera—

- immunization, oral route for, (50) 478.
- vaccines, effect of age and temperature, (48) 177.
- vibriones, duration of life in septic tanks, (49) 591.

Cholesterin content of blood and bile in absence of lipoids, (42) 258.

Cholesterin gland, use of term, (44) 466.

Cholesterins and cholesterin esters, determination, (41) 116.

Cholesterol—

- as an essential food constituent, (49) 161.
- feeding of white mice, effects, (41) 767, 768.
- nephelometric values of, studies, (42) 505.
- new color reactions, (47) 805.
- relation to intermediary fat metabolism, (45) 367.
- synthesis by infants, (43) 769.
- test for, (49) 410.

Cholina group of Curculionidae, (41) 556

Chondriome—

- and ergastoplasmic formations of embryonic sac, (44) 822.
- studies, (42) 228.
- theory, relation to structure of plant cell, (50) 223.

Chondriomes—

- evolution of, (45) 30, 31.
- in living cells, (45) 31.
- in microorganisms, (46) 127.
- in plant cells, (45) 30.
- in plants, (44) 629.
- studies, (43) 524, 525; (44) 822, 823.

Chondriosomes—

- in living cells, studies, (46) 823.
- in plants, (41) 727.
- status of, (44) 629.
- varieties in plant cells, (46) 824.

Chondrus elatus, mucilaginous substance of, (44) 202.

Chorizagrotis auxiliaris, control, (46) 153.

Chortophila brassicae, see Cabbage maggot.

Chrome yellow, tests in lengthening life of paint, (42) 591.

Chromium—

- chlorid, effect on wheat, (48) 323.
- determination, (41) 314, 711.
- effect on plant growth, (42) 525.
- effect on wheat, (50) 820.
- in Hagerstown soil, (49) Pa. 210, 617.
- salts, action on barley, (46) 716.
- sulphate, effect on wheat, (48) 323.

Chromogen, new, in *Galanthus*, (43) 327.

Chromogens, oxidation, formation of red pigment from, (50) 224.

Chromosomal materials, aberrations in, (49) 567.

Chromosome—

- complex, evolution of, (49) 567.
- fourth, nondisjunction in, (47) 172.
- number in dogs, (43) 269.
- number in marsupials, (50) 329.
- number in Metazoa, (45) 776.
- number in *Oenothera*, (41) 224.
- number in *Oenothera*, variation, (47) 126.
- number of organisms, (48) 869.
- number, relation to number of types, (43) 632.
- number, relation to pure strains, (42) 767, 821.
- number, variations in, effect, (49) 24.
- number variations in wheat hybrids, (49) 25.

Chromosome—Continued.

- relationships in wheat, (46) 430.
- theory of heredity, (41) 861.
- Chromosomes—
 - aberrant, behavior in corn, (47) 34.
 - and sex determination in *Abraaxas*, (48) 566.
 - arrangement of genes, (43) 268.
 - arrangement of genes, theory, (50) 129, 730.
 - behavior in fertilization, (41) 431.
 - behavior in partially sterile wheat hybrids, (50) Me. 26.
 - conjugation in relation to crossing-over, (44) 67.
 - crossing-over of genes, interference in, (50) 129.
 - distance between genes, (43) 268.
 - form, size, and number, (45) 222.
 - homologous, attraction between, (49) 567.
 - in lettuce, history and variations, (47) 126.
 - locating genes in, (49) 576.
 - location of genes for characters, (50) 823.
 - morphological studies, (50) 225.
 - of *Datura*, specificity, (49) 24.
 - of *Drosophila melanogaster*, revised map, (47) 667.
 - of species of *Drosophila*, comparison, (50) 528.
 - relation to heredity factors, (42) 560.
 - relation to segregation of heredity characters, (46) 267.
 - relation to somatic characters, (46) 223.
 - rôle in heredity, (49) 165.
 - sex, crossing-over between genes, (48) 565.
 - sex, of the monkey, (48) 471.
 - sex, studies, (43) 670.
 - structure and mechanism of division, (44) 668.
 - X, as affected by X-rays, (47) 68; (50) 226.
 - X, elimination by X-rays, (46) 673.
 - X, studies, (47) 172.
 - Y-type, and sex-linked inheritance, (48) 67.
 - Y- (W), inheritance in, (49) 668.
- Chrysanthemum—
 - cinerariifolium*, insecticidal principle of, (42) 647.
 - "crack-neck," (43) 849.
 - gall midge, control, (41) 258; (43) Conn.State 251.
 - gall midge, notes, (41) Conn.State 159; (43) Conn.State 251, U.S.D.A. 360; (48) 852; (49) 56.
 - gall midge, summary of information, (44) Ohio 354.
 - leaf bronzing, (46) 447.
 - leaf disease, notes, (45) 843.
 - leucanthemum* in insect powder, (41) U.S.D.A. 550.

Chrysanthemum—Continued.

- midge, new parasite, (49) 56.
- midge, studies, (43) U.S.D.A. 360.
- rust, cause, (47) 243.
- rust, notes, (44) Pa. 746.
- seedlings, raising, (45) 743.
- Chrysanthemums—
 - fumigation, (43) U.S.D.A. 362.
 - hardy varieties, (50) U.S.D.A. 140.
 - insects affecting, (49) U.S.D.A. 152.
 - manual, (41) 448.
- Chrysil, a new rubber, (42) 143.
- Chrysis shanghaiensis, parasite of oriental peach moth, (43) 359.
- Chrysobothris—
 - femorata*, see Apple tree borer, flat-headed.
 - mali*, notes, Oreg. (44) 850; (49) 555.
 - octocola*, notes, (45) U.S.D.A. 258.
 - spp., notes, (41) 758.
 - tranquebarica*, notes, (41) 62.
- Chrysocharis livida, notes, (47) 852.
- Chrysomela bigsbyana, life history notes, (43) 850.
- Chrysomphalus—
 - aonidium*, notes, (43) 555; (47) U.S.D.A. 359.
 - aurantii*, fumigation, (41) 164.
 - aurantii*, on orange-jassamine, (42) 52.
 - aurantii*, resistance to hydrocyanic acid fumigation, (48) 750.
 - dictyospermi*, chalcid parasites, (41) 463.
 - dictyospermi*, control, (45) 553.
 - dictyospermi*, control in Italy, (46) 559.
 - dictyospermi*, notes, (43) 851; (45) 853; (47) U.S.D.A. 157.
 - dictyospermi*, parasite of, introduction into Italy, (47) 660.
 - ficus*, see Florida red scale.
 - tenebricosus*, see Gloomy scale.
- Chrysomyia—
 - bezziana*, notes, (49) 55.
 - macellaria*, notes, (50) 482.
 - spp., notes, (48) 254.
- Chrysopa spp., notes, (47) U.S.D.A. 159.
- Chrysophlyctis endobiotica—
 - control, (47) Pa. 444.
 - life history, (46) 744.
 - notes, (43) 245; (44) U.S.D.A. 154; 245; (45) 145, 650, 847; (46) 450, 847; (47) 354; (48) 348; (49) 46.
 - studies, (42) 46, U.S.D.A. 246; (45) 353, 749.
- Chrysopidae, biology, (46) 458; (49) N.Y. Cornell 154.
- Chrysoplatycerus—
 - ferrisi* n.sp., description, (47) 660.
 - revision, (47) 660.
 - spp., notes, (48) U.S.D.A. 458.
- Chrysopoctonus new genus, erection, (42) 655.
- Chrysopoctonus patruelis n.sp., description, (42) 655.

- Chrysopogon montanus*, notes, (41) Fla. 528.
- Chrysops discalis*, tularaemia transmission by, (46) 152.
- Chrysothamnus nauseosus* and its varieties, paper on, (42) 143.
- Chufa, analyses, (50) 408.
- Chufa oil, constituents, (50) 408.
- Chufas, variety tests, (45) Guam 34.
- Church—
and community survey of Pend Oreille Co., Washington, treatise, (49) 94.
and community survey of Salem Co., New Jersey, treatise, (49) 94.
Federated, at Waco, Kansas, (49) 893.
rural, *see* Rural.
- Churning, chemistry of, (41) Mo. 680.
- Chute for use in dehorning and branding cattle, construction, (49) 87.
- Chute, livestock, plans, (42) Mont. 86.
- Chyle, ultraparticles of, (47) 80.
- Chyme, catalase concentration in, (41) 409.
- Cicada—
mouth parts of, (45) 360.
periodical, digestive system, (50) 257.
periodical, fungus parasite, (41) 456.
periodical, in Ohio, (41) Ohio 163.
periodical, notes, (42) 356; (43) Ind. 352; (45) 360; (46) 458, 853.
periodical, summary, (45) 853.
- Cicadellidae—
new species and records, (44) 251.
North American, distribution, (43) 450.
of Kansas, synopsis, (44) 355.
of South Carolina, (42) 356; S.C. 56.
of South Dakota, (47) 848.
- Cicadidae of Kansas, synopsis, (44) 353.
- Cicadidae of South Dakota, (47) 848.
- Cicadula sexnotata*, notes, (41) 551.
- Cicadula sexnotata*, parasite of, (44) 167.
- Cicindela limbalis awemeana*, habits, (44) 753.
- Cicinnobolus*, pycnidium of, (49) 145.
- Cicuta—
maculata, identification, (42) 776.
maculata, poisonous to livestock, (49) Ind. 584.
occidentalis, poisonous to livestock, (43) Nev. 273.
- Cider—
farm manufacture, (47) U.S.D.A. 508.
making experiments, (43) 807.
making in France, (42) 396.
manufacture from Minnesota apples, (42) Minn. 316.
preservatives, (46) 807.
recipes, (47) 113.
ropiness in, (43) 807.
sweet, bottling, (44) 534.
sweet, preservation, (47) Mich. 614.
value and preservation, (46) 207.
vinegar, home production, (50) Iowa 113.
vinegar, recipes, (47) 113.
- Cigar leaf roller on pears, (44) 760.
- Cigarette beetle—
control, (41) 354.
destruction by heat and benzoin, (46) 252.
notes, (42) 53; (50) V.I. 555.
parasite of, (49) 256.
- Cigars, manufacture, (48) 633.
- Cimbex americana*, notes, (46) 51.
- Cimbex quadrimaculata*, notes, (44) 258.
- Cimex lectularius*, *see* Bedbugs.
- Cimex rotundatus*, life history, (50) 556.
- Cinchona—
breeding and selecting methods, (42) 240.
breeding experiments, (49) 735.
culture, (42) 537; (43) 344.
industry in Java, (48) 447.
Tropical Botanical Station, notes, (42) 697.
- Cinders, furnace, fertilizing value and analyses, (42) 223.
- Cineraria diseases, (45) 851.
- Cineraria foot rot, (46) 544.
- Cinnamomum camphora*, transplanting experiments, (49) 745.
- Cinnamomum sieboldi*, pollen development, (43) 328.
- Cinnamon, preserving value, (42) 114.
- Cinnamon stripe canker, (49) 150.
- Cintractia sorghivulgaris*, notes, (45) 842.
- Cionus thapsi* cocoons, parasite of, (47) 261.
- Cirphis—
latiuscula, notes, (48) 357.
loreyi, notes, (42) 751.
spp., notes, (43) 52.
unipuncta, *see* Army worm.
- Cirrhosis of liver in horses, (45) 585.
- Cirsium palustre*, use as fiber plants, (44) 435.
- Cissus branch knots, (47) 541.
- Cistern water, source of lead contamination, (47) 790.
- Cistern water, treatment, (43) 279.
- Cisterns—
and cistern filters, design and construction, (48) 184.
concrete, construction, (43) 188.
notes, (45) 187.
- Citrange juice, analyses, (47) Calif. 660.
- Citrangequats, new citrus hybrid, (49) 41.
- Citranges—
analyses, (48) 159.
citrus hybrids, (44) 44.
culture experiments at San Antonio, (47) U.S.D.A. 438.
- Citrates, effect on phagocytosis, (41) 187.
- Citric acid—
as source of carbon for fungi, (50) 630.
decolorization, (47) 411.
determination, (41) 803.
effect on germination of rust spores, (46) 846.
effect on molds, (45) 463.

Citric acid—Continued.

- in fruit juices, (49) 805.
- in milk, (46) 615.
- in tomato juice, (42) 315.
- manufacture, (48) U.S.D.A. 13; (50) 313.
- manufacture from lemons, (45) 808.
- production by fungi, (42) 727.
- titration curves for, (48) 710.

Citricola scale, control, (48) 152.

Citricola scale in Japan, synonymy, (49) 355.

Citrina, use of term, (43) 433.

Citriphaga mixta n.g. and n.sp., description, (41) 555.

Citromyces sp., studies, (42) 608.

Citrus—

- automatic disbudding, (42) 140.
- bacterial spot, notes, (41) 450.
- black fly in Jamaica, summary, (44) 59; (46) 246.
- black fly in Panama, (45) 655.
- black fly, notes, (41) 355, 660; (45) 456.
- black fly, summary of information, (44) 59, U.S.D.A. 454.
- blast, (42) Calif. 842.
- blast and black pit, (46) 244; (49) Calif. 650.
- blast in California, inoculation, chambers for, (49) 821.
- blast, outbreak in California, (49) 846.
- blast, relation to weather, (50) 752.
- blast, studies, (43) 156.
- brown rot, control, (46) 651; (49) 846.
- brown rot in Australia, (48) 548.
- bud mutation in, (50) 822.
- bud variation in, (47) U.S.D.A. 143.
- canker—
 - characteristics and control, (41) 55.
 - control, (47) 845; (48) 746.
 - development in Japan, (44) 750.
 - effect of stomatal differences, (48) 744.
 - effect of temperature and humidity on growth, (44) 649.
 - eradication, (43) 550; (44) 450, 650; (46) 48, 544, 850; (49) 547.
 - eradication in Florida, (42) 151; (47) 153.
 - eradication in South Africa, (45) 751.
 - history of, (43) 349.
 - in Hawaii, (46) 244; (48) 456.
 - in relation to structure of stomata, (47) 546.
 - in Tunis and Algeria, (49) 45.
 - infection of wild lime, (44) 745.
 - notes, (41) 450, 452; (47) 838.
 - organism, behavior in soil, (43) 550.

Citrus—Continued.

canker—continued.

- organism, effect of fungicides, (45) 850.
- relative susceptibility of species, (43) 848.
- resistance, effect of age of tree, (48) 247.
- resistant varieties, (48) 248.
- studies, (41) 543, 751; (42) 646.
- susceptibility, relation to age of tissues, (48) 745.
- central packing houses, (44) P.R. 237.
- chlorosis, (42) Calif. 842.
- chlorosis, soil relationships, (48) 848.
- collar rot, control, (49) 547.
- culture in Florida, handbook, (49) 438.
- die-back, control, (42) Fla. 837.
- die-back in Bombay, (50) 249.
- die-back, notes, (44) 842; (50) 244.
- disease, new, (48) 746.
- diseases and remedies, (47) 546.
- diseases in China, (45) 647.
- diseases in China and Philippines, (46) 746.
- diseases in Cuba, (43) 448.
- diseases in Porto Rico, (46) 149.
- diseases, notes, (41) 543, 546, 841.
- diseases, spraying for, (43) 550.
- diseases, studies, Calif. (42) 842; (47) 650.
- dry root rot, notes, (44) Calif. 744.
- Euphalerus citri on, (43) 451.
- experiment station at Lake Alfred, (47) 834.
- foot rot, notes, (46) 44; (47) 44, 348.
- fruit—
 - beverage, preparation, (49) Calif. 412.
 - black blight, notes, (47) 839.
 - black spot, studies, (48) 149.
 - brown rot, life history, (48) 744.
 - diseases in transit, (48) P.R. 247.
 - juice, canned, for jelly making, (47) Calif. 614.
- fruits—*see also* Lemons, Oranges, etc.
 - abscission, (46) 529.
 - as affected by too liberal use of water, (41) 622.
 - breeding experiments, (49) 735.
 - bud development and structure, (41) Fla. 539.
 - bud selection, (43) 542; (44) 145.
 - by-products, (48) U.S.D.A. 13.
 - climatic requirements, (41) U.S. D.A. 417.
 - coloring, (46) 339.
 - culture, (41) 339; (45) 44.
 - culture experiments, (42) 736; (43) 40, U.S.D.A. 339; (50) Miss. 38.
 - culture experiments in Philippines, (41) 650.
 - culture in Bombay, (43) 745.
 - culture in China, (45) 239.

Citrus—Continued.

fruits—continued.
 culture in Fiji, (43) 40.
 culture in Gulf States, U.S.D.A., (44) 44; (50) 38.
 culture in Porto Rico, (45) 238.
 culture in South Africa, (41) 540.
 culture in Syria, (43) 838.
 decay, causes, (43) 41.
 decay during transportation, (45) 547.
 dodder affecting, (43) 652.
 effect of illuminating gas on abscission of flowers, (42) 333.
 export, cause of wastage, (47) 546.
 export from South Africa, cause of waste, (46) 652; (49) 249.
 fertilizer experiments, (41) 447, Fla. 539, Fla. 540; (42) Calif. 830, Fla. 837; (43) 342; (44) Calif. 737; (48) Calif. 446.
 for Philippines, (47) 834.
 for Yuma Mesa, (42) Ariz. 341.
 freezing, (50) 644.
 from Porto Rico, legal restrictions on, (47) 834.
 fumigation, (41) 164, Calif. 550, 551, 757; (43) 54.
 gases for coloring, tests, (50) P.R. 540.
 grading and packing in Australia, (43) 836.
 immature, laws and regulations, (41) 741.
 improvement, U.S.D.A. (43) 439, 440.
 insects affecting, (42) 451; (43) 52.
 irrigation, (41) 741.
 manuring, furrow system, (41) 741, 837.
 mottling in, (42) Calif. 819.
 new varieties, nutrition studies, (48) 159.
 of Japan, (48) 738.
 peel, vitamin A in, (46) 567.
 regeneration of roots, (47) Calif. 640.
 rinds as hog feed, (41) Md. 570.
 rootstocks for, (44) Calif. 737.
 self-sterility studies, (45) Ariz. 438.
 spraying experiments, (43) 157.
 stocks for, (41) 446; (42) 140, Calif. 537; (43) 41; (48) 41.
 tear stain, (44) U.S.D.A. 750; (46) 453, (49) 846.
 thrips affecting, (50) 555.
 unfermented juice, manufacture, (43) Calif. 717.
 variety experiments, (43) U.S.D.A. 339.
 withertip, (46) 453.
 fumigation, factors affecting, (44) U.S.D.A. 250.
 grafting, (50) 543.

Citrus—Continued.

grandis, polyembryonic shoots, (43) 133.
 grove pests, control, (46) 351.
 groves, Argentine ant in, (41) 166.
 groves, beneficial fungi in, (46) 245.
 groves, decline, (46) 642.
 groves, fertilizer experiments, (48) Ariz. 442; (49) 834.
 groves, green manures in, (42) Calif. 830.
 groves, green soldier bug in, (41) 355.
 groves, irrigation, (47) Calif. 538.
 groves, legumes in, (44) P.R. 237.
 groves, management, (47) Calif. 640.
 groves, rejuvenating, (42) Calif. 830.
 groves, soil improvement, (41) 241.
 groves, tree records for, (50) Calif. 239.
 groves, use of manure in, (43) 239.
 groves, windbreaks for, (45) P.R. 638.
 groves, windbreaks, value, (44) 533.
 groves, winter injury, (42) Fla. 838.
 gumming diseases, (49) Calif. 649.
 gummosis, (42) Calif. 842.
 gummosis, nature, causes, and development, (49) 650.
 gummosis, remedy, (45) 451.
 hybrid, new, Eustis limequat, (46) 40.
 hybrids, new types for home garden, (49) 41.
 hybrids, notes, (44) 44.
 industry in Florida, rôle of Mexican bean beetle in, (47) 555.
 industry in Japan, (49) 438.
 industry in lower Rio Grande Valley, (50) 38.
 insect pests, effects of freeze of 1917, (43) 554.
 insects affecting, (44) 57; (45) 656; (46) 558; (47) 551.
 insects affecting in Porto Rico, (43) 555.
 jelly juice, manufacture, (47) Calif. 509.
 leaf roller, notes, (43) 556.
 leaves, composition, (44) 544.
 leaves, permeability studies, (46) 432.
 Macrosporium on, (46) 348.
 marmalade juice, manufacture, (47) Calif. 509.
 marmalade juice, studies, (48) Calif. 508.
 mealybug, *see* Mealybug, citrus.
 medica, growth-inhibiting substance in, (42) 335.
 melanose, control, (48) Fla. 849, U.S.D.A. 849.
 melanose, notes, (43) 550.
 mite, control, (48) Calif. 461.
 nematode, studies, Calif. (42) 842; (49) 350.
 pectin extracts, homemade, use, (49) U.S.D.A. 114.
 pectin extracts, jellying power, (50) 508.

Citrus—Continued.

- pests in Brazil, (50) 555.
- pests in California, control, (48) 52.
- Phomopsis in California, (50) 752.
- pink disease, (42) 646; (46) 44.
- pink disease, distribution, (46) 652.
- plant bugs, notes, (41) 551.
- plants, introduction, quarantine procedure, (50) U.S.D.A. 743.
- plants, polyembryonic, venation and senescence, (43) 133.
- plants, relative susceptibility to *Cladosporium citri*, (49) 846.
- plants, subtribe and new genus, (41) 432.
- psorosis, (42) Calif. 842.
- psylla, life history and habits, (50) 257.
- psyllid, new species, (50) 155.
- psyllid pest, notes, (47) 254.
- red scale, control in Italy, (46) 559.
- red scale, resistance to hydrocyanic acid fumigation, (48) 750.
- red spider, control, (48) 152.
- root nematode, notes, (48) 548.
- root rots, (42) Calif. 842.
- root weevil as strawberry pest, (47) 556.
- root-bark channeller, habits and control, (43) 456.
- rust mite, method of control, (42) 551.
- rust mite, notes, (43) 555.
- scab, cause and control, (48) U.S.D.A. 647.
- scab, control, (46) 48, U.S.D.A. 746; (50) P.R. 552.
- scab, early occurrence in Japan, (41) 157.
- scab, effect of temperature on growth and infection, (45) 356.
- scab epidemics, relation to weather, (50) 752.
- scab, notes, (43) 550; (44) P.R. 450; (45) P.R. 653.
- scale, gray, remedies, (41) 757.
- scale, purple, notes, (41) 660.
- scaly bark, control, (43) 551.
- seedlings, tests, (44) Calif. 738.
- seedlings, water culture experiments, (42) 443.
- soil types of California, (48) Calif. 447.
- species in Brazil, (47) 642.
- spots and blemishes, (41) 350.
- spray schedule, (44) 250.
- stem-end rot, control, (50) U.S.D.A. 149.
- tambora disease, (50) 243.
- thrips, control, (44) P.R. 453; (48) 853; (49) Fla. 847.
- trees, analyses, (48) Calif. 523.
- trees, as affected by alkali, Calif. (42) 640, 818.
- trees, as affected by sodium nitrate, (42) Calif. 814.

Citrus—Continued.

- trees, composition during growth, (42) Calif. 819.
- trees, dusting for rust mite, (44) 858.
- trees, effect of cold, (43) 550.
- trees, effect of salts, (47) Calif. 626.
- trees, fumigation, (49) U.S.D.A. 849.
- trees, fumigation schedule, (42) 250.
- trees, injury from windstorm in southern California, (43) 41.
- trees, pruning, (49) Calif. 641, U.S.D.A. 742.
- trees, spraying equipment for, (50) 659.
- trees, spraying experiments, (49) Fla. 838.
- trees, top-working, principles, (45) 440.
- white fly, *see* White fly, citrus.
- white snails affecting, (50) 657.
- withertip, notes, (43) 550; (49) 846.
- Cladiinae*, new species, (46) 661.
- Cladius isomerus*, life history, (47) U.S.D.A. 59.
- Cladosporium*—
 - carpopophilum*, control, (48) 351.
 - carpopophilum*, notes, (46) 453.
 - citri*, effect of temperature on growth and infection, (45) 356.
 - citri*, notes, (43) 550; (45) 653; (46) U.S.D.A. 746; (47) Fla. 650.
 - citri* on avocado, (41) Fla. 545; (43) 550.
 - citri*, susceptibility of citrus varieties to, (49) 846.
 - from stone fruits, cross-inoculation, (50) 656.
 - fulvum*, control, (46) Va.Truck 336.
 - fulvum*, notes, (42) 48; (45) 851; (46) 451.
 - fulvum* on tomato, studies, (41) 843.
 - herbarum citricolum*, notes, (43) 551.
 - herbarum* in soil, activities, (50) 620.
 - herbarum*, notes, (45) 381.
 - herbarum* on cold storage meat, (47) 560; (48) 258.
 - paeoniae*, notes, (50) 355.
 - sp.*, notes, (45) 649; (46) 544; (50) 547.
 - sp.* on rubber, (43) 45.
 - spp.*, notes, (49) 149.
 - theobromicolum*, notes, (45) 653.
- Clams, analyses, (43) Me. 662.
- Clams, canned, analyses, (50) Conn.State 160.
- Clams, opened, analyses, (47) Me. 764.
- Clania moddermanni*, notes, (42) 361.
- Clapper rail, new, from Florida, (43) 659.
- Clasterosporium*—
 - carpopophilum*, control, (50) 451.
 - carpopophilum*, notes, (43) 243; (44) 842.
 - degenerans, morphology and systematic position, (46) 239.

Clastoptera—

- new varieties, description, (44) 853.
- theobromae n.sp., description, (49) 450.
- vittata, notes, Mass. (43) 158; (47) 453.

Claviceps—

- cross-inoculation experiments, (47) 245.
- paspali, effect on cattle, (44) 78.
- paspali infected grasses, cattle poisoning by, (45) 179.
- paspali, notes, (45) 783.
- purpurea, loss from, (47) 245.
- purpurea, notes, (46) 239, 322; (48) 432.
- purpurea on Manitoba wheat, (46) 240.
- purpurea, studies, (50) 143.
- sclerotia, germination, (47) 839.
- spp., distribution, (50) 545.
- spp., notes, (42) 474.

Clay—

- addition to sandy soil, effect, (45) 418.
- analysis, (49) 414.
- and sand, apparatus for separating, (50) 14.
- as an ampholyte, (47) 608; (49) 811.
- as disperse systems, (48) 117.
- behavior toward acids, (47) 722.
- characterization, (47) 619.
- coagulation, protective action of humus, (43) 515.
- colloidal, chemical nature, (50) Mo. 210.
- colloidal, determination in soils, (48) 618.
- colloidal, flocculation, relation to H-ion concentration, (49) 503.
- colloidal, in agricultural soils, (48) 810.
- composition, studies, (46) 620.
- deposits of Kentucky, (50) 686.
- determination in heavy soils, (47) 118.
- distribution in Appalachian Mountains, (46) 487.
- effect on chemical reactions in soil, (41) 720.
- flocculation, studies, (48) 118; (50) 810.
- hygroscopic power, (48) N.J. 353.
- hygroscopicity and quantity of water adsorbed, (48) 117.
- in its relation to piles, experiments, (50) 86.
- in soils, relation to properties, (50) 809.
- layer in soils, composition, (48) Mo. 616.
- mud, physical properties, (50) 117.
- physical properties, (50) 87.
- plasticity, measuring, (50) 417.
- plasticity phenomena, studies, (41) 719.
- production in United States, (50) 727.
- purification of sewage effluent by, (48) 786.

Clay—Continued.

- soil, evaporation studies, (44) 210.
- soils, management, (42) Wis. 323; (48) N.Dak. 20.
- soils, nitrification of filter press cake in, (48) 820.
- soils of Surinam, studies, (45) 328.
- soils, physical and chemical studies, (50) 511.
- soils, preparation, (42) 85.
- structures, in Germany, (44) 189.
- suspensions, formation of layers in, (46) 810.

Clays—

- colloidal, analyses, (49) 811.
- pleistocene, colloidal properties, (49) 811.

Cleistotheopsis circinans—

- n.g. and n.sp., description, (41) Ill. 247.
- notes, (44) 844.

Clematis vitalba, variation in, (42) 726.

Clemson College, notes, (41) 700; (47) 400.

Cleodiplosis aleyrodici n.sp., description, (48) 358.

Cleora pampinaria, *see* Cranberry spanworm.

Cleorini, studies, (45) 360.

Clepsydrina ovata, parasitism by, (42) 851.

Clerget divisor, evaluation, (44) 413.

Clerget method of double polarization, error in modifications, (45) 317.

Cleridae—

- American, new, (42) 751.
- North American, larvae of, (43) 854.
- synopsis, (47) 658.

Click beetle, notes, (50) 457.

Clidemia die-back, notes, (44) 747.

Climate—*see also* Meteorology.

- and crop relations in United States, (41) U.S.D.A. 417.
- and plant growth, relation, (50) 807.
- and soil conditions for broom corn, (43) U.S.D.A. 232.
- and vegetation of a hill, effect of slope exposure, (50) 526.
- and weather of Vermont, (49) 208.
- and wheat yields at Maryland Station, (50) 641.
- as affected by forests, (42) 642; (44) 618.
- as indicated by tree growth, (42) 418, U.S.D.A. 619; (47) U.S.D.A. 414.
- bioclimatic law, (41) 16.
- classification, (43) 418; (47) U.S.D.A. 316.
- control by lakes, (44) 811.
- effect on distribution of vegetation in United States, (48) 429.
- effect on fruit trees, (49) N.Y.Cornell 338; (50) U.S.D.A. 114.
- effect on life and seasonal cycles of insects, (41) N.J. 58.
- effect on sugar beets, (46) 115.
- effect on wheat production in Nebraska, (50) 715.

Climate—Continued.

- evolution, (49) 412.
- evolution in northwest Europe, (46) 314.
- formula and reduced rainfall, (41) 16.
- in Philippines, relation to abaca distribution, (47) 809.
- interpreting by plant indicators, (41) 327.
- modifying, (46) 418.
- of Algeria, (49) 208.
- of Brazil, (41) 211, 620; (50) 511.
- of British Columbia, (41) 620; (44) 417; (49) 15, 615.
- of Canada, (41) 211.
- of Great Plains, (50) 207.
- of Japan and Formosa, U.S.D.A. (44) 121, 122.
- of Kansas, (42) 508.
- of Khartum, (50) 511.
- of Liberia, (41) 619.
- of Manitoba, relation to agriculture, (47) 16.
- of Mexico, (41) 821.
- of Montana, (42) Mont. 807.
- of Morocco, (46) 712.
- of Nebraska, (49) 115.
- of Netherlands, (43) 811.
- of Netherlands Indies, (50) 416.
- of Panama, (49) U.S.D.A. 719.
- of Saskatchewan, (43) 620.
- of South Africa, (42) 212.
- of South America, bibliography, (46) U.S.D.A. 17.
- of South Dakota, (43) 618.
- of the Cotton Belt, (42) U.S.D.A. 14.
- of Utah, (41) Utah 17.
- relation to acute respiratory conditions, (44) U.S.D.A. 416.
- relation to alfalfa seed production, (42) Utah 806.
- relation to forest fires in Montana, (47) U.S.D.A. 315.
- relation to period between blooming and ripening, (41) 510.
- relation to sun spots, (50) 315.
- rôle in plum and prune pollination, (42) Calif. 41.
- tropical, effect on Surinam soils, (49) 511.
- world classification, (42) 212.

Climates—

- evolution, (49) 15.
- of British Empire suitable for cotton, (43) 620.
- of the continents, treatise, (48) 508.
- of the world, exercises and laboratory manual, (50) 797.
- of the world, treatise, (50) 807.
- of United States, (44) 314.
- tropical, variability v. uniformity in, (47) 509.

Climatic—

- changes evident in peat deposits, (46) 317.
- changes, nature and causes, (48) 14.

Climatic—Continued.

- changes, noninstrumental evidence, (41) 510.
- conditions at Yuma Experiment Farm, (48) U.S.D.A. 209.
- conditions of a greenhouse, (43) U.S.D.A. 511.
- conditions of a greenhouse, seasonal march, (47) Md. 411.
- conditions of Maryland, (47) 412.
- conditions, quantitative study from plant growth, (47) 413.
- conditions, relation to diet, (46) 561.
- control, factors of, (42) 713; (44) U.S.D.A. 414.
- control, relation to plant growth, (43) 431.
- cycles, (50) 415.
- cycles, and drought periods, (47) U.S.D.A. 414, 628.
- cycles and tree growth, (46) 27.
- cycles, studies, (49) 30.
- data from tree rings, (43) 809.
- factors and height growth of trees, correlation, (48) 539.
- factors, effect on timber line, (43) 840.
- soil types, effect of climatic factors, (48) 210.
- study from annual rings of trees, (47) 226, 510.

Climatological data, *see* Meteorological observations.

Climatology—

- importance to Philippine agriculture, (41) 315.
- normals, secular trends, and climate changes, (50) U.S.D.A. 114.
- of Australia, agricultural, (45) 18.
- of wheat in Italy, (48) 315.
- tendencies in, (47) 615.

Climograph charts, notes, (43) U.S.D.A. 718.

Climograph. uses, (44) U.S.D.A. 415.

Clinorchis sinensis infestations, diagnosis, (49) 78.

Cloacitis in poultry, (45) 382, 888.

Cloacitis, ulcerative, use of term, (44) 881.

Clonostachys rosea, inoculation on potatoes, (42) 246.

Clostridium—

botulinum—

- agglutination studies, (49) 881.
- complement fixation studies, (50) 786.
- effect of spices, (50) 366.
- effect on nervous system, (50) 682.
- in human alimentary tract, (48) 165.
- in Wisconsin, (50) 682.
- pure cultures from single cells, (50) 682.
- spores, thermal death time, (48) 164.
- test for, (48) 659.

Clostridium—Continued.

botulinum—continued.

type C in poultry, (50) Ill. 383.
under household conditions, (49)
567.

pastorianum, capacity for nitrogen fixation, (48) 516.

pastorianum in partially sterilized soil, (47) 417.

pastorianum increase in soils, (47) 319.

sporogenes, viability in carbonated beverages, (46) 754.

welchii, biology of, (44) 74.

Cloth, treatment to prevent mildew, (41) 551.

Cloth, weaving, dyeing, and finishing, treatise, (50) 695.

Clothes moth, webbing. biology, (45) 656.

Clothes moths, control, (47) Mich. 658; (50) U.S.D.A. 53.

Clothes moths, effect of red cedar, (47) U.S.D.A. 162.

Clothes moths, notes, (46) 51.

Clothing—

and textiles, graduate work in, (50) 297.

club manual, (48) Ill. 497.

clubs, organization, (47) Ill. 798.

construction, teaching, score cards in, (47) 696.

contest, girls', plans, (43) 495.

course on, (41) 698.

project, elementary, (46) 697, 792.

project, outline, (48) 97.

selection and care, (42) U.S.D.A. 898.

selection, construction, and care, manual, (48) 297.

selection, demonstration, (43) 495.

textbook, (41) 698.

treatise, (46) 95.

Cloud—

funnel, over Lake Michigan, (44) U.S.D.A. 121.

photography, (44) U.S.D.A. 121.

systems, (45) 418.

Clodburst rainfall at Taborton, New York, (45) U.S.D.A. 321.

Cloudiness—

effect on oxygen content of bog water, (46) 632.

in New York State, (43) U.S.D.A. 511.

in United States, (44) 208.

Clouds—

artificial, for frost protection of vineyards, (49) 615.

cirrus, use in weather forecasting, (43) 319.

classification, (41) U.S.D.A. 120.

classification tables, (41) 808.

cumulus, over fire, (44) U.S.D.A. 121.

iridescent, (43) U.S.D.A. 718.

nomenclature, (44) U.S.D.A. 416.

Clover—

acid content, relation to soil acidity, (42) 424.

Clover—Continued.

alsike—

as affected by pH, (49) 825.

breeding experiments, (48) Can. 31.

Cercospora leaf blight of, (42) N.Y.State 350.

culture and uses, (44) U.S.D.A. 332.

culture experiments, (41) Idaho 225; (43) Wash. 436; (49) Alaska 426.

culture in lead and zinc regions, (43) 514.

rust of, (41) 656.

seed production, (45) 740; (49) Can. 734.

seed production cost, (47) Idaho 593.

seed yields, (41) Idaho 226.

v. red, (42) Ohio 829.

yields, (43) Minn. 636.

yields on irrigated wild meadows, (43) Oreg. 22.

and alfalfa seed movement, (50) Mich. 496.

and grass competition as affected by fertilizers, (41) 322.

and grass mixtures, spring seeding, (48) West.Wash. 435.

and grass yields, (44) 434.

and timothy, fertilizer experiments, (45) 737; (47) 320.

and timothy hay, rotation experiments, (48) Minn. 332.

and timothy sod, value for cut-over timber soils, (47) Minn. 121.

anthracnose, notes, (44) 48.

aphid, biology and control, (48) Idaho 853.

aphid, notes, (45) Idaho 251.

as affected by ammonium sulphate, (47) Mass. 218.

as affected by gypsum, (49) 727.

as affected by sulphur, (45) 26; (49) Ohio 625.

as cover crop, (43) Wash. 743; (49) Mont. 136.

as forage crop in Denmark, (43) 177.

as green manure, (41) Del. 136, Can. 832.

as hay and pasture crop, (45) U.S.D.A. 86.

as hog pasture, (41) Ohio 178.

as orchard cover crop, (49) Mont. 833.

as protein supplement for pigs, (49) Mich. 469.

as shade crop for orchards, (43) Oreg. 145.

as silage crop, (41) 732; (42) Wash. 828.

bacteria as affected by sulphates, (41) 427.

bacteria, cross-inoculation tests, (41) 523.

Clover—Continued.

- bacterial leaf spot, studies, (50) 348.
 bird's foot, for lime-poor soil, (41) 230.
 bird's foot, seed production, (45) 740.
 bird's foot, seed treatment, (41) 646.
 bitter, as green manure, (42) Calif. 830.
 breeding experiments, (45) 734.
 bur, culture, (45) Miss. 126.
 bur, leaf spot, (44) Ala.Col. 744, 748.
 bur, notes, Guam, (46) 726; (48) 228.
 button, variety tests, (41) Hawaii 138.
 Cercospora leaf spot, (48) 846.
 cost of production, (43) Ohio 392.
 crimson, as green manure, (42) Va. 427.
 crimson, culture, (44) U.S.D.A. 36; (45) Miss. 126.
 crimson, culture in Kentucky, (44) 434.
 crimson, hogging down, (46) S.C. 768.
 crimson, liming experiments, (46) Md. 321.
 crimson, seed weight, relation to rate of growth, (48) N.J. 329.
 culture, (41) Ind. 19; (44) Mont. 331, Alaska 523.
 culture and use in Australia, (47) 227.
 culture experiments, (41) Can. 528; (47) Alaska 527; (48) Ga.Coastal Plain 128; (49) 329, Alaska 426; (50) Alaska 532.
 culture in Alaska, Alaska (41) 30, 31.
 culture in British Columbia, (42) 733.
 culture on acid soils, (48) Wis. 213.
 culture on Canada prairies, (41) 732.
 culture on peat soil, (43) 23; (46) 216.
 digestibility coefficients, (48) 574.
 drought resistance, (44) Wis. 227.
 ecological and pathological studies, (47) 825.
 effect on following crop, (45) N.Dak. 226, 738; (47) Alaska 527; (49) Ohio 329.
 effect on nitrate formation in soil, (43) 215.
 effect on soil acidity, (47) 723.
 Egyptian, *see* Berseem.
 experiment station, new, (49) Mich. 495.
 failure, causes, (48) 46.
 fall planting, (43) Wash. 738.
 fertilizer experiments, (41) Del. 136, N.Dak. 140, 823; (42) 223, Ohio 636, Minn. 826; (43) Ind. 331, Ohio 726, Can. 727, Can. 729; (44) Kans. 225, Minn. 321, 815; (45) Ill. 121, Ohio 126; (47) Wash. 124, 226; (50) Minn. 120, Minn. 121.
 for cut-over land pasture, (41) Minn. 387.
 for hay and pasture, tests, (41) 334.
 for newly broken land, (41) Idaho 226.

Clover—Continued.

- ground, use as grasshopper bait, (43) 353.
 growth in alkali soil, (42) Utah 28.
 growth in artificial light, (48) 26.
 hay, analyses, (45) Iowa 776.
 hay and shelled corn, feeding value, (47) Minn. 374.
 hay, composition and digestibility, (43) Mont. 771.
 hay, cost of production, (42) Mo. 188.
 hay, energy value, (47) 69.
 hay, fertilizer experiments, (50) Can. 817.
 hay for fattening cattle, (43) Ind. 870.
 hay meal, feeding value, (42) 369.
 hay v. alfalfa for heifers, (49) Ohio 375.
 hay v. oat straw, feeding value, (48) 398.
 hay, yields, (41) Idaho 226; (50) Can. 432.
 hogging down, costs and returns, (49) Ohio 372.
 immature, vitamin content, (41) 762.
 immigrant, species, (50) 829.
 inoculation, (48) Wash.Col. 832.
 insects affecting, (47) 655; (50) N.Y.Cornell 57.
 Japan, as forage crop, (44) U.S.D.A. 37.
 Japan, characteristics and uses, (48) 435.
 Japan, culture, (45) Tenn. 131; (49) La. 824.
 Japan, germination tests, (44) 233.
 Japan, liming experiments, (46) 426.
 Japan, notes, (47) Miss. 428.
 Japan, seeding experiments, (47) Ark. 732; (48) S.C. 629.
 Japan, value, (49) N.C. 733.
 juice, as milk substitute for calves, (42) 471.
 leaf weevil, activities, (45) 258.
 leaf weevil in Iowa, (49) 761.
 leaf weevil, life history and control, (48) N.Y.Cornell 460.
 leaf weevil, notes, (47) Ind. 156.
 leaf weevil, oviposition, (49) 848.
 leaf weevil, summary of information, (44) U.S.D.A. 554.
 leafhopper, notes, (45) Mich. 251.
 liming experiments, (41) Del. 136, Del. 137; (42) 523; (43) Can. 729; (45) Ohio 126.
 little known, culture experiments, (46) 634.
 Macrosporium sarciniforme on, studies, (44) 244.
 manuring experiments, (45) Ohio 126.
 Mediterranean, varieties new to United States, (50) 30.
 mite, control, (46) 161; (47) Calif. 653; (48) Calif. 460.
 mite, notes, (47) Idaho 763.

Clover—Continued.

- mite on cherries, control, (44) Calif. 752.
- mixture, yields, (49) Ohio 329.
- mixtures for seeding waste land, (41) 231.
- mixtures, tests, (41) 229.
- mosaic disease, protozoa with, (49) Mich. 45.
- mosaic, organism associated with, (48) Mich. 644.
- mosaic, studies, (50) 651.
- nationality trials, (47) 227.
- need in Michigan, (47) Mich. 196.
- nematode disease, notes, (44) Oreg. 839.
- notes, (47) Miss. 428.
- nutrient requirements, (46) 716.
- planted with sugar cane, (47) La. 427.
- plowing tests, (44) N.Dak. 509.
- powdery mildew, notes, (50) Ohio 145.
- rate of manuring tests, Minn., (50) 120, 121.
- red—
 - anthracnose, notes, (42) N.Y.State 350.
 - as affected by fineness of lime, (43) 325.
 - as affected by pH, (49) 825.
 - as affected by wet conditions, (41) N.Dak. 140.
 - as affected by windbreaks, (44) N.Dak. 524.
 - as forage crops, (42) Wis. 373; (46) Mass. 30.
 - as green manure, (44) Alaska 328, Alaska 522; (47) R.I. 725.
 - as hay crop, (48) N.Dak. 226.
 - as nitrogenous fertilizer, (46) 518.
 - as orchard cover crop, (43) Pa. 538.
 - as pasture crop, (46) Mont. 364; (47) Ark. 776.
 - bacterial leaf spot, (47) 350.
 - breeding experiments, (46) 633; (48) Can. 31, Mich. 224; (49) Oreg. 525; (50) Minn. 132, Can. 433.
 - breeding methods, (44) 827.
 - composition and digestibility, (41) Mass. 276.
 - corolla tube length and fertilization by bees, (45) 825.
 - culture experiments, (41) Idaho 225; (43) Wash. 436; (44) Alaska 328, N.Dak. 524; (45) U.S.D.A. 531; (47) Mich. 829; (49) Oreg. 525; (50) U.S.D.A. 435.
 - culture in Scotland, (41) 530.
 - culture on drained bog soil, (42) 29.
 - disease in Northwest, (44) 747.
 - eelworm disease, Idaho, (45) 251; (47) 751.
 - effect of temperature range, (50) 20.

Clover—Continued.

- red—continued.
 - factors affecting failure, (43) Wash. 333.
 - fertilizer experiments, (42) 330; (49) Oreg. 525.
 - field tests, (41) N.Dak. 824.
 - for seed, seeding experiments, (49) 735.
 - for silage, (41) Mo. 334.
 - for weanling pigs, (42) Mont. 67.
 - germination as affected by fertilizers, (44) Va. 721.
 - germination as affected by organic substances, (41) 523.
 - inoculation, (41) Alaska 30.
 - insects affecting, (41) 251; (42) 743; (45) 755.
 - irrigation experiments, (41) Nev. 728.
 - leaf spot, notes, (41) U.S.D.A. 346; (42) N.Y.State 350.
 - manuring experiments, (50) 29.
 - mosaic, notes, (48) 243.
 - nematode disease, (42) 742; (43) 46; (45) 444.
 - notes, (47) Alaska 527.
 - pollination, (41) 430; (47) 857.
 - potassium-nitrogen ratio, factors affecting, (47) 530.
 - root rot, popular account, (45) Ohio 447.
 - rotation experiments, (46) 436; (47) Alaska 527; (48) 227, Minn. 332.
 - rust, notes, (46) 741.
 - seed color and inheritance, (46) 634.
 - seed color characteristics, (46) 732.
 - seed consumption in United States, (49) 32.
 - seed, cost of production, (47) Idaho 593.
 - seed, home-grown v. imported, (46) 729; (50) 435.
 - seed identification, (46) 732.
 - seed production, (46) 832; (49) Can. 734.
 - seed, recognition and yield, (44) 733.
 - seed size as affecting yield, (41) 536.
 - seed, studies, (43) 638.
 - seed yields, (41) Idaho 226.
 - seeding experiments, (41) N.Dak. 140; (47) Ark. 732; (49) Oreg. 526.
 - selection, (46) 831.
 - self-fertility in, (49) Ky. 131.
 - stem rot, control, (43) 46.
 - sulphur fertilizers for, (41) 427.
 - v. alsike, (42) Ohio 829.
 - variation and inheritance in, (46) 438.
 - varieties for silage, (49) N.H. 328.

Clover—Continued.

sickness, cause, (43) 46.

sickness, notes, (43) 45.

stem borer, life history, (44) U.S.D.A.
164.

stem rot, studies, (41) N.C. 450 ; (45)
447.

subterranean, behavior and adaptation, (49) Fla. 824.

subterranean, value, (49) N.C. 733.

Swedish red and Silesian, yields, (50)
334.

sweet, *see* Sweet clover.

tops, green and cured, rate of decomposition, (43) 212.

uptake of nutrients and storage, (50)
333.

utilization, (50) Minn. 121.

v. timothy, rotation experiments,
N.Y.State (42) 327; (50) 421.

value for cut-over timber soils, (47)
Minn. 121.

varieties, (46) Mich. 633.

varieties, characteristics, (50) 237.

varieties, comparison, (49) Ohio 329.
variety tests, (43) Can. 735; (45)

Can. 822; (47) Wis. 432; (49)
Idaho 732.

vitamin A extraction from,

vitamins in, (42) 556, 759.
weed seeds for suckling pigs, (50)

372. white. *Cercospora* leaf blight. (42)

N.Y.State 350.

white, culture experiments, (43)
Wash. 436: (47) Alaska 527.

white, fertilizer experiments, (47) Pa.
429

white, Rhizoctonia leaf rot, (42) N.Y.
State 350

white wilt studies (46) 743

wilt disease, notes, (49) 44.

worm, green, notes, (43) N.C. 450.

worm, green, on beans, (43) Conn.
State 251: (44) Wis. 249. Mass.

453.

worm, green, on soy beans, (42) 649;
(43) 759; (50) Ohio 256

yields. (42) Minn. 826.

Clovers, analyses, (50) Oreg. 7.

Cloves, preserving value, (42) 114.

Club work—*see also* Boys' clubs and Girls' clubs.

in Indiana, (41) 495.

Clubroot—*see also* Cabbage.

disease, control, (42) 47; (47) 542.
studies, (41) 655.

Cnaphalocrocis medinalis, on rice, (44)
250; (46) 458.

Cnaphalodes strobilobius, life history, (43)

Cnemidocoptes gallinae, control. (42)

Cnethocampa pityocampa, comb. n. (44)

757.

6) 83
7) 82

78.

Coccidiosis—British 779; (44) 384; (45) 384; bovine, in Calif. (44) 384; (45) 384

Coal—

- and coke ashes as fertilizers, (46) 220.
- as talcum substitute to induce rapid boiling, (41) 410.
- brown, decomposition, (43) 213.
- brown, use in conserving liquid manure, (42) 721.
- dust, effect on crops, (46) 221.
- gas, toxic action upon plants, (49) 522.
- liquid fuel lost in, (44) 725.
- stoves, efficiency tests, (43) 592.
- tar as source of fuel for internal-combustion engines, (49) 590.
- tar, bird-repellent effect, (45) 537.
- tar emanation injury to plants, (47) 749.
- tar food colors, analysis, (47) 312.
- tar preparations, insecticidal value, (45) N.C. 362.

Coalfish oil, vitamin A content, (46) 567.

Cob construction, papers on, (50) 88.

Cobalt—

- effect on *Aspergillus* growth, (49) 27.
- in arable soils, (48) 19.
- in plants, (49) 520.

Cobnuts, culture and diseases, (44) 44.

Coccidae—*see also* Scale insects.

- collection from California, (45) 660.
- from Malay Peninsula, (46) 351.
- identification, (45) 254.
- Italian, monograph, (46) 53.
- n.g. and n.sp., descriptions, (45) 456.
- notes, (42) 155.
- of Argentina, (41) 255.
- of Australia, catalogue, (45) 456; (46) 155, 559.
- of Australia, new species, (42) 453.
- of British Islands, review, (50) 155.
- of Ceylon, (48) 154, 357.
- of Egypt, (48) 553.
- of Florida, (50) 155.
- of India, check list, (47) 358.
- of India, notes, (42) 546.
- of Italy, (41) 551.
- of Michigan, internal parasites of, (42) 154.
- of Sao Thome, (43) 452.
- of South Africa, (42) 155; (44) 853; 954.

United States, (41)

~7

Coccids, life cycle, (45) 251, Me. 456.

Coccinella arcuata, notes, (45) 551; (47) 253.

Coccinella transversoguttata, notes, (43) U.S.D.A. 455.

Coccinellidae in Florida, (47) 555.

Coccinellidae, larvae, (45) 361.

Coccobacillus—

- acidiorum*, notes, (41) 662; (47) 360.
- insectorum malacosomae* n.sp., description, (43) 853.
- insectorum*, notes, (44) 760.

Cocomyces—

- dentatus*, description, (45) 547.
- hiemalis*, treatment, (41) U.S.D.A. 349.
- sp., notes, (44) Calif. 744, Oreg. 840.

Coccophagus—

- orientalis*, parasitism by, (47) 363.
- saissetiae* n.sp., description, (48) 59.
- spp., notes, (43) 252.

Coccothra spissana, notes, (50) 156.

Coccus—

- acuminatus*, control, (47) 53.
- acuminatus*, notes, (47) U.S.D.A. 359.
- citricola* (*longulus*), remedies, (41) 757.
- viridis* in Panama, (45) 655.
- viridis*, notes, (48) U.S.D.A. 458.

Cochylis moth in Bordeaux, (41) 59.

Cochylis moth, trap bait for, (45) 454.

Cock, pseudohermaphroditic, (47) 863.

Cockchafer larvae, destruction, (50) 457.

Cockchafer, summary, (45) 756.

Cockerel, open joint in, (44) 881.

Cockerels—

- and capons, comparison of growth and feed consumption, (43) Md. 574.
- caponizing, (50) Mo. 873.
- effect of vitamin B on growth of organs, (49) 569.
- feeding experiments, (50) Can. 778.
- handling as broilers, (47) West.Wash. 476.
- method of handling, (49) West.Wash. 576.
- organs, variation and correlations in, (50) 779.
- surplus, early elimination, (43) 73.
- weight of testes as affected by feed, (46) 271.

Cocklebur—

- billbug, notes, (48) 359.
- oil, analyses, (43) 801.
- paired seeds, mineral constituents, (43) 431.
- poisonous to livestock, (50) U.S.D.A. 77.
- popular account, (43) U.S.D.A. 832.

Cockroach, greenhouse, studies, (41) Conn.State 158.

Cockroaches—

- American, control, (42) Minn. 358.
- control, (47) 848.
- eradication, (47) Mich. 849.
- German, biology and control, (46) 53.
- in Minnesota, (42) Minn. 358.
- in Porto Rico, (49) 252.

Cockroaches—Continued.

- popular summary, (46) 153.
- role in disease, (48) 552.

Cocks, castration and law of retrogression, (44) 865.

Cocks, hen-feathered, (46) 272.

Cocksfoot pastures in New Zealand, (41) 640.

Cocoa—

- analyses, (42) 162; (43) Ariz. 764.
- and chocolate industry, (45) 643.
- and its adulteration, (41) 467.
- bean shell meal, analyses, (43) N.J. 672.
- butter, detection in butter, (46) 14.
- butter, digestibility, (43) 64.
- culture in British colonies, (50) 442.
- detection in feeds, (50) 468.
- determination of fat in, (41) 714.
- effect on gastric response, (44) 665.
- growth, relation to soil shrinkage, (47) 514.
- insects affecting, (46) 458.
- inspection and analysis, (45) Conn.State 365.
- pests, (49) 654.
- phytin content, (47) 366.
- production in British Empire, (41) 741.
- production in Tropics, (42) 599.
- shell meal, analyses, (45) N.Y.State 469; (46) Can. 168.
- theobromin determination in, (45) 413; (47) 807.

Cocobolo—

- distribution and value, (49) 744.
- identity, (46) 843.
- toxic properties, (47) 443.

Coconut—

- beetles—*see* *Oryctes* spp.
- bleeding disease, control, (46) 448.
- breeding experiments, (49) 735.
- bud rot—
 - and cacao pod rot, comparison, (46) 453.
 - cause, (43) 551; (45) 751.
 - control, (43) 653; (45) 443.
 - description, (43) 151, 152; (46) 553.
 - in Jamaica, (43) 48.
 - in Philippines, (43) 156; (50) 656.
 - notes, (41) 350, 841; (42) 50; (44) 746; (46) 454; (47) 147, 348; (48) 44.
 - role of insects in spread, (45) 351.
 - studies, (48) 849.
 - two types, (50) 149.
- butterfly on bananas, (42) 751.
- cake—*see also* Copra cake.
 - analyses, (42) 770.
 - composition and use, (44) 363.
 - energy value, (47) 69.
 - feeding value, (48) 770.
 - rancidity, (41) 10.
- caterpillar in Ceylon, notes, (50) 455.
- caterpillar, studies, (41) 757.

Coconut—Continued.

- contracts, types, (46) 786.
- cryptogamic diseases, (45) 653.
- die-back, notes, (47) 148.
- disease in St. Lucia, (45) 850.
- disease, notes, (45) 843.
- diseases in Grenada, (43) 551.
- diseases, notes, (42) Guam 49, 50, 741.
- dwarf, growth and yield, (42) 737.
- fat, determination, (41) 412.
- fiber for rope making, test, (42) 783.
- globulin, amino acids from, (44) 710.
- globulin and press cake, nutritive value, (41) 262.
- globulin, hydrolysis, (44) 709.
- holdings in Philippines, tenancy, (46) 785.
- husk ash, fertilizing value, (45) Guam 23.
- industry in Dahomey, (45) 441.
- industry in Guam, (42) Guam 37.
- juice, vitamin C in, (49) 563.
- leaf beetle, two-colored, studies, (41) 758; (49) 658.
- leaf disease, description, (42) 647.
- leaf miner, notes, (43) 52, 851.
- leaf stalk rot, (46) 454.
- leaves, carbon dioxid absorption, (45) 219.
- meal—
 - analyses, (41) Ind. 564, Can. 565, Ind. 868, N.Y.State 868; (42) 263, Tex. 769, Mass. 866; (43) N.J. 69, Ky. 373, N.J. 672, 867; (44) Hawaii 71; (45) Tex. 68, N.Y.State 469, N.J. 774, Vt. 872; (47) N.Y.State 172, Ind. 473, N.J. 571.
 - composition, (41) 564.
 - composition and retail prices, Conn.State, (44) 176; (45) 375.
 - effect on butter fat and milk production, (44) Calif. 775.
 - effect on milk production, (47) Calif. 674.
 - feeding value, (42) Calif. 868; (44) Del. 367; (46) Calif. 576; (47) Md. 73, 76, Wash.Col. 575, 782; (48) Wash.Col. 71, 770.
 - proteins, growth-promoting value, (46) N.Y.Cornell 870.
 - proteins, nutritive value, (50) 267.
- mealybug on avocado, (42) 546; (43) 851.
- oil, analysis, (45) 719.
- oil, antiarthritis properties, (50) 771.
- oil, evaluation, (41) 115.
- oil, hydrogenation, (50) 309.
- oil, losses in refining, (49) 311.
- oil, production, (46) 636.
- oil, production in Philippines, (48) 112.
- oil, rancidity of, (43) 201.
- oil, refining, (46) 109.
- oil, sampling and examination, (43) 805.
- oil, vitamin content, (41) 363; (47) 661.

Coconut—Continued.

palm—

- bleeding disease, (42) 145.
 - culture and use, (44) 237.
 - diseases and pests, (45) 351.
 - diseases in East Africa, (47) 547.
 - diseases in Grenada, (48) 456.
 - dispersal, botany, and uses, (48) 41.
 - from Philippines, survey, (44) 640.
 - heart rot, (47) 153.
 - insects affecting, (43) 57; (44) 57; (46) 53; (47) 848.
 - nematode disease, (45) 752.
 - root disease, control, (44) 642.
 - pests, (44) 237.
 - press cake, for human food, (44) 168.
 - products, notes, (42) 12.
 - proteins, nitrogen distribution in, (47) 201.
 - red ring disease, (42) 643, 746; (45) 653; (46) 454.
 - red stripe weevil, summary, (49) 855.
 - rhinoceros beetle, notes, (47) 855.
 - root disease or red ring, (42) 643, 746; (45) 653; (46) 454.
 - rot, studies, (42) 643.
 - scale, notes, (43) 851.
 - soils, fertility, (44) 620.
 - soils, Malayan, (41) 319.
 - stem bleeding disease, (45) 541.
 - water, analyses and uses, (45) 507.
 - weevil, Tahiti, notes, (47) 761.
- Coconuts—
- as affected by Para grass, (49) Guam 427.
 - culture, (41) 447; (44) V.I. 339; (49) 743.
 - culture and expression of oil, (43) 240.
 - culture experiments, (41) 540, 740; (42) Guam 37, 43; (45) Guam 43; (48) Hawali 338.
 - culture in Cochin China, (41) 540.
 - culture in Java, monograph, (42) 538.
 - culture in Philippines, (43) 441.
 - culture in Porto Rico, (45) 347.
 - dwarf, in Malaya, (47) 835.
 - fertilizer experiments, (42) Guam 37; (45) 239, 347; (46) 40, Guam 734; (47) 835; (48) P.R. 235; (49) Guam 435; (50) P.R. 540.
 - germination, (48) 838.
 - improvement by selection, (45) 228.
 - insects affecting, (41) 59, 455; (42) Guam 54, 451; (43) 52; (45) 656; (47) 551; (50) 556.
 - legume cover crops for, (49) Guam 427.
 - multiformity in, (46) 736.
 - origin, (47) 834.
 - pests affecting, (50) 256.
 - pollination, (46) 643.
 - premature dropping, cause, (48) 856.
 - production in French colonial possessions, (42) 32.

Coconuts—Continued.

- production in West Indies, (45) 33.
 - Psyllid affecting, (48) 252.
 - treatise, (45) 743; (47) 642.
 - variation in, (42) 640.
- Cocum, antiscorbutic value, (42) 163.
- Cod liver oil—
- and butter, vitamin A in, (45) 564.
 - and vitamins, (46) 256.
 - antirachitic substance in, (47) 369.
 - chemistry of, (49) 608.
 - digestibility coefficients, (47) U.S.D.A. 560.
 - effect on antiscorbutic factor of lemon juice, (49) 58.
 - effect on calcium and phosphorus metabolism, (50) 262.
 - effect on calcium assimilation, (46) 566.
 - effect on inorganic metabolism, (50) 570.
 - effect on phosphorus content of serum, (46) 166.
 - effect on rats affected with rickets, (45) 368; (48) 364.
 - effect on rickets, (46) 473; (48) 65.
 - effect on tuberculosis in guinea pigs, (49) 479.
 - effect on vitamin A in milk, (50) 568.
 - effective constituent, separation, (50) 801.
 - growth-promoting and antirachitic values, relation, (50) 771.
 - in winter feeding of milch cows, (49) 780.
 - industry in Newfoundland, (50) 665.
 - manufacture and food value, (50) 267.
 - osteodystrophic power with deficient diet, (49) 566.
 - potency of vitamin in, (49) 461; (50) 664, 665, 858.
 - preparation, effect on vitamin value, (48) 64.
 - substance in, affecting bone development, (47) 566.
 - therapeutic uses, history, (50) 263.
 - therapeutic value, (46) 568.
 - v. butter, effect on deposition of calcium in bones, (47) 861.
 - v. butter fat, antirachitic value, (49) 471, 472.
 - vitamin A in, (46) 567; (48) 467, 862.
 - vitamins in, (47) 365, 465, 565, 768, 769, 862.
- Cod muscle, composition, (43) 569.
- Cod roe, vitamin A in, (47) 768.
- Codeine and codethyline monohydrate, crystallography, (41) 802.
- Codfish, vitamin A in, (47) 662.
- Codling moth—
- and superheating, (48) 358.
 - arsenicals for, (47) 655.
 - as walnut pest, (41) 457, 665.
 - brood studies, (48) N.J. 354.
 - chart showing effect of temperature on oviposition, (50) 51.

Codling moth—Continued.

- choice between walnut and apple, (47) Calif. 654.
- control, (41) 59, Ill. 146, 160, Iowa 237, 460; (42) Va. 345; (43) Ind. 338, 743, Oreg. 756, Mo. 757; (44) Oreg. 160, N.J. 349, Oreg. 850; (45) 137, U.S.D.A. 151, Mich. 235, 255, 755, 856, 857; (46) Mass. 50, 157, Mo. 350, N.J. 556; (47) 361, Mich. 440, Wis. 451, Wash.Col. 550, 551, 849; (48) Mich. 251, N.J. 354, 358, Mo. 650; (49) Wash.Col. 251, Idaho 756; (50) 357.
- control in Arkansas Valley, (45) 457.
- control in British Columbia, (44) 854.
- control in Colorado, (43) 161; (46) Colo. 55.
- control in Grand Valley, (46) U.S.D.A. 54.
- control in New Jersey, (43) 357.
- control in Oregon, (43) 660; (49) 452.
- control in Ozarks, (43) 357.
- control in Washington, (46) 52.
- control in western New York, (49) 152.
- control v. extermination, (43) 558.
- development, relation to temperature, (47) 852.
- effect of nicotin sulphate on, (45) U.S.D.A. 151.
- false, in Africa, (45) 857.
- false, on walnuts, (42) 547.
- history in British Columbia, (41) 552.
- in Arkansas, life history, (50) Ark. 558.
- in Colorado, life history, (45) U.S.D.A. 855.
- in Illinois, studies, (49) 54.
- in Paradise region, (47) Calif. 653.
- in pears, control, (49) 759.
- in walnuts, control, (42) 547; (44) 253; (48) 152, 651.
- in walnuts, life history, (44) Calif. 752, (46) 855.
- insect enemies in South Africa, (44) 167.
- larvae, winterkilling, (44) 656.
- life history, (43) Ind. 351, N.Mex. 358; (45) Idaho 251; (47) N.Mex. 457.
- new tachinid parasite of, (48) 752.
- notes, (42) 648; (43) Colo. 158, Mont. 758; (46) 749; (47) 253, 550; (48) N.J. 353.
- papers on, (50) 844.
- relation to temperature, (49) U.S.D.A. 509.
- second brood, (42) Mass. 356.
- spraying experiments, (45) Mo. 252, Wash. 252.
- spraying, insecticides for, (45) 457.
- studies, (41) N.Mex. 164; (45) Ind. 149, Idaho 554; (46) N.Mex. 352; (49) N.Mex. 154.
- trap, description, (46) U.S.D.A. 55.

Codling moth—Continued.

- treatment, index number for rating, (44) 655.
- Codling worm life history and correlated spraying program, (49) Ohio 656.
- Coelaenomenodera eloeidis n.sp., description, (44) 854.
- Coelinidea meromyza, notes, S.Dak., (44) 652; (49) 549.
- Coelinidea meromyza, parasitism by, (47) S.Dak. 451.
- Coeliodes ruber in Italy, (41) 555.
- Coenomyia pallida attacking white grubs, (42) 550.
- Coenzym, thermostability and differentiation from yeast vitamin, (46) 309.
- Coenzymes and vitamin B, (46) 866.
- Coeur d'Alene Lake, Idaho, and overflow lands, (45) 289.
- Coffee—
 - analysis, official method, (44) 9.
 - and its adulteration, (41) 467.
 - bean, poisonous to livestock, (42) U.S.D.A. 879.
 - bean, poisonous to sheep, (44) 678.
 - bean weevil affecting stored corn, (44) 760.
 - bean weevil, notes, (46) 751.
 - beetle borer, notes, (47) 163.
 - berry beetle, fungi affecting, (50) 249.
 - berry beetle in Java, parasites of, (49) 255.
 - berry beetle in Sumatra, (46) 159.
 - berry beetle, studies, (45) 559.
 - black rot, notes, (42) 145; (45) 48; (46) 448.
 - blossom, biological study, (50) 39.
 - borer in Brazil, (48) 856.
 - borer, red, notes, (43) 450.
 - breeding and selection, (43) 838.
 - breeding experiments, (41) 741; (49) 735.
 - bug, life history and control, (46) 557.
 - bug, life history and habits, (44) 58.
 - bug, life history and parasites, (48) 53.
 - chicory, analyses, (46) 416.
 - culture, (44) Hawaii 44; (50) 637.
 - culture experiments, (41) 242, 650, 740; (42) Guam 37; (45) 140.
 - culture in Belgian Kongo, (45) 347.
 - culture in Colombia, (46) 391.
 - culture in French colonies, (43) 342.
 - detection in feeds, (50) 468.
 - determination of caffein in, (43) 804; (47) 313.
 - die-back in Uganda, (46) 149.
 - die-back, notes, (46) 844; (47) 839.
 - disease in Surinam, (47) 153.
 - disease, new, (43) 247.
 - diseases, (42) 46; (45) 653; (47) 44, 348, 838; (49) 547.
 - diseases and control, (44) 49, 342.
 - diseases, notes, (41) Hawaii 153.
 - effect on gastric response to food, (44) 665.

Coffee—Continued.

- examination for substitutes, (46) 416.
 feathering of cream in, (50) 852.
 fertilizer experiments, (41) 817; (44) P.R. 235; (48) P.R. 234; (50) P.R. 540.
 improvement, (45) 228.
 insects affecting, (41) 59, 455; (43) 252; (44) 57; (49) 550.
 insects of Porto Rico, (47) 847.
 inspection and analysis, (45) Conn. State 365.
 lands, (41) P.R. 342.
 leaf blotch, notes, (47) 839.
 leaf curl, control, (47) 44.
 leaf disease, control, (44) P.R. 247.
 leaf disease, notes, (41) 350; (42) 145, 146; (43) 444; (47) 838; (49) 150.
 leaf miner, notes, (47) 847, 852.
 leaf spot, control, (48) 149.
 leaf spot, notes, P.R. (46) 454; (49) 150.
 leaves and pulp, caffeine content, (41) 412.
 leaves killed by cold, chemical changes in, (48) 222.
 Liberian, disease, (42) 542.
 Liberian, insects affecting, (47) 53.
 monograph, (48) 447.
 phloem necrosis, notes, (49) 150.
 plantations, shade for, (44) P.R. 442.
 pollination by bees, (50) 663.
 production in Brazil, (43) 292.
 refuse, digestibility, (50) Mass. 168.
 report of A.O.A.C. referee, (41) 799.
 roasted, antineuritic action, (49) 663.
 Robusta, as food substitute, (46) 755.
 Robusta, characteristics and use, (47) 313.
 Robusta, culture, (41) 242.
 root rot, description, (45) 357.
 selection experiments, (41) 741, 837; (43) 748.
 spraying, (41) 350.
 substitutes, (41) 66.
 substitutes, analyses, (42) 162.
 substitutes, determination of caffeine in, (43) 804.
 substitutes, use for food, (47) 612.
 thread blight, notes, (43) 152.
 transplanting, P.R. (41) 342; (44) 235.
 varieties in Uganda, (43) 342.
 variety tests, (41) 837; (45) 140.
 wood, identity, (46) 843.
 Cognogethes punctiferalis, notes, (49) 758.
 Cogon as paper-making material, (41) 732.
 Cohesion in liquids, demonstration, (42) 334.
 Cohune nut, globulin, analyses, (45) 9.
 Cohune oil, digestibility, (42) 552.
 Coir fiber for rope making, test, (42) 782.
 Coix lacryma jobi agrestis, agronomic data, (46) 230.
 Coix smut, notes, (45) 541.
 Coix, waxy endosperm in, (47) 334.
 Coke and coal ashes as fertilizers, (46) 220.
 Coke in domestic appliances, efficiency, (49) 289.
 Cola, breeding experiments, (49) 735.
 Cola, culture experiments, (41) 740; (42) 43.
 Colaspidea atra, biology, (41) 59.
 Cold frame, use of, treatise, (41) 538.
 Cold storage—
 conditions for export fruit at Cape Town, (46) 652.
 control of insects, (46) 853.
 diseases of apples, control, (43) Iowa 38.
 effect on beef and mutton, differences, (49) 11.
 effect on carnosin in meat, (47) 858.
 effect on insects, (42) Calif. 848.
 experiment station in Italy, (47) 195.
 holdings, (49) U.S.D.A. 892.
 of eggs, (41) U.S.D.A. 179.
 of fruits, (41) 443.
 of fruits as affected by handling and packing, (43) 39.
 of fruits, value, (42) Calif. 831.
 plant of U. S. Department of Agriculture, (43) 892.
 plants, plans, (47) 688.
 plants, temperature and humidity, (44) U.S.D.A. 717.
 reports, U.S.D.A. (41) 66, 558.
 stocks, (43) U.S.D.A. 694.
 treatise, (44) 487.
 Cold surfaces, insulation to prevent sweating, (49) 591.
 Cold waves in Brazil, (49) 314.
 Colds, primary cause, (44) U.S.D.A. 717.
 Coleocentrus, notes, (43) 858.
 Coleophora—
 laricella, *see* Larch case bearer.
 n.spp., description, (41) 258; (44) 163.
 nigricella, control, (48) 751.
 Coleoptera—
 illustrata, (41) 62.
 key, (44) 451.
 life cycle in, (45) 251.
 North American, food habits, (47) 362.
 occurrence in human intestine, (47) 358.
 of America, catalogue, (44) 657.
 of Europe, (48) 554.
 of France, keys to genera, (49) 761.
 Coleosporium ribicola, studies, (42) Conn. State 247.
 Coleus blumei leaves, mottling of, (48) 525.
 Colic, forms of, (49) 283.
 Collar rot of fruit trees, (47) 152.
 Collard dusting for worms, (49) N.C. 757.
 Collards, breeding experiments, (41) Ga. 145.
 Collargol for abortion and Malta fever, (46) 277.

Collective bargaining, status, (44) 197.

College—

- of Agriculture, Nanking, China, history, (50) 596.
- teaching, improvement, (49) 492, 704.
- winnings at 1922 International, (49) Mich. 97.

Colleges—see also Agricultural colleges.
women's war work in, (41) 95.

Collembola, occurrence and distribution, (46) 752.

Colletes inaequalis, paper on, (42) 748.

Colletotrichum—

- agaves, notes, (47) 348; (48) 846.
- andropogonis, notes, (47) 544.
- camelliae, studies, (45) 48; (47) 754.
- carthami, n.comb., notes, (46) 239.
- circinans, notes, (46) 145; (49) Wis. 644; (50) 143.
- circinans on onion, (44) 844.
- coffeanum, notes, (46) 844; (47) 348, 839.
- erumpens, notes, (48) 242.
- falcatum, notes, (46) 45.
- falcatum on sugar cane, (43) La. 348.
- gloeosporioides, notes, (42) 148, Calif. 842; (43) 550; (44) U.S.D.A. 750; (46) 453, 653; (47) 44; (49) 846.
- gloeosporioides, variations in, (44) 842.
- gossypii, notes, (47) 348; (49) N.C. 747; (50) 349.
- gossypii spore germination, effect of acidity, (49) 125.
- lagenarium, control, (47) U.S.D.A. 751.
- lagenarium, notes, (49) Tex. 442.
- lindemuthianum, notes, (46) N.Y.Cornell 648.
- lindemuthianum on beans, (42) 242.
- lindemuthianum, parasitism of, Minn., (43) 46; (50) 42.
- lindemuthianum, resistance of beans to, (41) 154.
- linicolum n.sp., description and studies, (41) 544.
- linicolum, notes, (46) 743; (48) 46.
- nicotianae n.sp., notes, (50) 248.
- nigrum and Gloeosporium piperatum, identity, (44) 445.
- nigrum, conidial forms and synonymy, (44) 445.
- oligochaetum, control, (49) 146.
- oligochaetum, notes, (42) 46; (45) 842; (46) 447.
- on rose bushes, (45) 654.
- phomoides, notes, (49) 149.
- phomoides on tomato, (41) 156.
- pisi, description, (50) 146.
- pisi, notes, (47) Wis. 446; (50) 652.
- sp., notes, (47) Fla. 650.
- sp. on flax, (41) 655.
- sp. on rubber, (43) 45.
- spp., description, (46) 239.
- spp., notes, (44) Conn.State 149; (45) 649; (46) 451, 647, 845; (49) 540.

Colletotrichum—Continued.

- theobromae, notes, (50) 42.
- trifolii, notes, (48) 741.
- Collodion membrane, flexible, preparation, (47) 13.
- Collodion sacs, preparation, (45) 11; (48) 311.
- Collodium osmometers, preparation and use, (49) 520.
- Colloid chemistry—
 - advances in and application, (41) 801.
 - and proteins, (44) 501.
 - application to food chemistry, (43) 609.
 - application to oils and fats industry, (50) 801.
 - applications, (47) 9; (49) 308.
 - bibliography, (49) 109.
 - manual, (44) 409; (45) 108.
 - of peat soils, (48) 814.
 - of proteins, treatise, (47) 501.
 - principles, treatise, (50) 709.
 - relation to agriculture, (50) 196.
 - rôle in soil formation, (42) 118.
 - textbook, (45) 610.
 - treatise, (41) 310; (46) 501; (48) 801.
- Colloidal—
 - action in growth, (41) 25, 26, 27, 132.
 - action of protoplasm, (43) 429.
 - adsorptive power of soils, (48) 214.
 - behavior and proteins, treatise, (49) 109.
 - bodies, heterotropic action, effects of age and salts, (48) 824.
 - clay, flocculation, relation to H-ion concentration, (49) 503.
 - clay in soils, amount and composition, (49) 811.
 - clay percentage of soil, relation to contraction, (41) 812.
 - compounds, sterilizing, new method, (48) 502.
 - condition of soils, reversibility, (41) N.Y.Cornell 121.
 - content of soils, effect on mechanical analysis, (49) 316.
 - function in soils, (48) 17.
 - lead arsenate, preparation and properties, (50) 608.
 - material in soils, determining, (50) U.S.D.A. 811.
 - matter in soils, quantity, (45) 804.
 - mixture as affected by acids and amido compounds, (41) 221.
 - mixtures, permeability, (41) 631.
 - particles, origin of electrical charges, (47) 424.
 - properties of bog water, (43) 224.
 - properties of soils, (50) 417.
 - reaction, fundamental to growth, (42) 433.
 - silica, adsorption of plant food by, (49) 17.
 - substances, effect on growth of wheat seedlings, (41) 422.

Colloidal—Continued.

- substances, filtration, (44) 181.
- substances, gold number determination, (43) 12.
- systems, properties, (47) 30.

Colloids—*see also* Biocolloids.

- adsorption by, (46) 810.
- and sewage disposal, (47) 593.
- colors of, (42) 768.
- effect on soil reactions, (41) 720.
- effect on viscosity of molasses, (47) 717.
- formation, monograph, (46) 9.
- hydration, defining physical constants, (41) 27.
- in biology and medicine, treatise, (41) 680.
- in cane juice, separation, (47) 206.
- in soil, absorption of water by, (48) 421.
- in soil, adsorption of plant food by, (49) 17.
- in soil, determination and valuation, (50) 618.
- in soil, notes, (48) 618.
- in soil, origin, (46) 809.
- in soil separates, microscopic estimation, (49) 722.
- in soil, treatise, (44) 210; (49) 414.
- methods and apparatus for study, (45) 503.
- physics and chemistry of, (42) 109.
- physics and chemistry of, treatise, (48) 801.
- plant, studies, (43) 524.
- plasma, studies, (42) 727.
- properties, treatise, (49) 109.
- splitting of neutral salts in contact with, (41) 364.
- swelling, measurement, (44) 727.

Collybia sp., notes, (42) 150.

Collybia velutipes, notes, (48) 451.

Collyriclum faba, life history, (44) 158.

Colocasia antiquorum, exudation of water by, (43) 633.

Colocasia antiquorum, transpiration stream, reaction of, (49) 520.

Colocasieae, culture experiments, (44) 433.

Colocynth tar, medical uses, (47) 585.

Colon typhoid bacteria, occurrence in swine, (45) 385.

Colon typhoid group, behavior toward arsenic (44) 78.

Colon typhoid group, identification and isolation, (42) 775.

Colon typhoid intermediates as cause of disease in birds, (49) R.I. 81.

Colon-aerogenes group, correlation studies, (43) 791.

Colon-aerogenes group in corn meal, (46) 356.

Colon-aerogenes organisms in milk, (42) 72; (44) 272.

Colonization—*see also* Agricultural colonization and Land settlement.

in Algeria, (50) 793.

in Norway, (50) 193.

Colonization—Continued.

- of vacant farms in France, (48) 92.
- projects for Argentina, (43) 290.
- projects in Austria, (45) 492.
- projects in Wisconsin, (44) 692.

Color—*see also* Pigmentation.

- aleurone, inheritance in corn, (44) 726.
- changes in green vegetables on cooking, (43) 458.
- chart for blending colors in flowers, (43) 240.

eye, production in birds, (43) 866.

factors, new, in guinea pigs, (49) 368.

in plants, (50) 728.

inheritance—

aberrant classes, in doves and canaries, (42) 765.

in cats, (42) 376, 763.

in cattle, (43) 375, Wis. 771; (45) 375, 874.

in corn, (41) 733.

in corn silk, (46) N.Y.Cornell, 634.

in cotton, (46) 31.

in cowpeas, (41) 828.

in crossbred calves, (47) 668.

in dogs, (43) 669.

in eye of *Drosophila*, (47) 569.

in fowls, (41) Kans. 76; (47) 276; (50) 227, 330.

in fresh-water fish, (48) 566.

in guinea pigs, (42) 764.

in horses, (43) 378; (44) 269.

in Jersey cattle, (42) 472; (46) Ky. 372.

in Karakul sheep, (46) 270; (48) 368.

in leaves of rice and barley, (50) 330.

in mice, (41) 175, 866; (42) 763; (44) 362, 866.

in oats, (41) N.Y.Cornell 642.

in pea flowers, (47) 822.

in phlox, (46) 723; (47) Pa. 437.

in pigeons, (42) 764; (48) 565.

in pigs, (43) Iowa 71; (44) 767; (49) Pa. 269.

in plumage of fowl crosses, (48) 165.

in rabbits, (42) 762; (48) 565; (49) 66.

in Shorthorn cattle, (50) 128.

in sorghums, (47) 634.

in tobacco flowers, (47) Calif. 635.

of eggshells, (48) N.J. 373.

of seed coat of sorghum, (50) 431.

studies, colorimeter for, (44) 135.

tricolor, in guinea pigs, (42) 764.

unusual, in a steer, (50) 128.

laboratory of Bureau of Chemistry, problems, (43) 14.

laboratory, work of, (50) 714.

measurement, apparatus for, (46) 111.

Color—Continued.

- measurement, laws of, (47) 716.
- measuring in sugar manufacture, (44) 807.
- of flowers, optimum altitude for, (50) 427.
- of hair, dark winter, production, (49) 165.
- of soils, relation to organic matter in, (49) Iowa 318.
- production in feathers of birds, (46) 73.
- reactions of fungi, (46) 724.
- standards for pH measurement, (43) 211; (44) 411; (46) 110.
- standards, need for use in field, (49) 616.
- transformation due to oxidation, (50) 224.
- variations in *Allium*, (47) 822.

Coloradia pandora, notes, (49) 655.

Colorado—

- College, notes, (41) 700; (43) 198; (46) 195.
- Potato Experiment Station, work of, (45) 40.
- River Basin, protection and development, (48) 487.
- River, development, (47) Ariz. 187.
- River waters, conservation, (48) 89.
- seed laboratory, organization, (44) 233.
- seed laboratory, report, (44) Colo. 233.
- Station, notes, (41) 700.
- Station publications, index, (45) 299.
- Station, report, (41) 98; (43) 197; (45) 297; (47) 696; (49) 494.

Colorimeter—

- description, (48) 502.
- for measuring color in flowers, (44) 135.
- new, description, (48) 411.
- use in H-ion determination, (42) 229.

Colorimetric analysis, treatise, (46) 709.

Colorimetric estimations with two colored substances, (43) 414.

Coloring materials, use of Chinese ang-khak, (42) 416.

Coloring matter in food, analysis, (44) 9; (47) 312.

Coloring matter in plants, (48) 431.

Coloring matters, chemistry of, progress, (41) 613.

Coloring matters, natural, treatise, (41) 110.

Coloring matters prohibited in food in Italy, (43) 65.

Colostrum—

- effect of pasteurization temperature, (48) Mo. 671.
- feeding, effects, (50) 883.
- formation, theory, (41) 80.
- function, (47) 463.
- importance to newborn calf, (48) 86; (50) 479.
- importance to newborn infant, (50) 562.

Colostrum—Continued.

- ingestion, effect on blood composition of calves, (47) 463.
- of camel, analysis, (48) 175.
- problem and solution, (49) 283.
- proteins in, determination, (47) 715.
- relation to immunity of newborn calves, (49) 480.
- studies, (44) 776.

Colts—

- breaking and training, (50) U.S.D.A. 372.
- cost of raising, (49) 69.
- draft, feeding, 46 Mo. 363.
- feed records, (41) Can. 570.
- feeding and care, (49) 297.
- growth curves, (50) Mo. 467.
- navel ill, (42) Mich. 694.
- navel infection in, (42) Okla. 561.
- raising, (44) N.Y.Cornell 571; (48) Mo. 666.

thoroughbred, growth, (46) 73.

Columbaci fly, devastations by, (50) 156.

Columns, treatise, (48) 89.

Colydiidae, biology, (42) 655.

Colza, Chinese, seed and plant studies, (44) 429.

Colza, culture and use in Uruguay, (45) 35.

Colza oil, production, (46) 636.

Combustion and heat transference in domestic boiler, (49) 688.

Comfrey, nutritive value, (41) 557.

Comfrey roots, ash constituents, (41) 502.

Commerce of United States, (44) 393.

Commercial statistics of Japan, (49) 895.

Commodities, quantity and price, statistical data, (49) 392.

Commodity prices and farming policy, (49) 692.

Communities, associate and federate, (49) 295.

Community—

and church survey of Pend Oreille Co., Washington, treatise, (49) 94.

and church survey of Salem Co., New Jersey, treatise, (49) 94.

building, floor plan and theater, (48) 395.

center, treatise, (44) 892.

civics and rural life, (47) 598.

consciousness, development, (43) 91.

fairs, management, (45) 696.

fairs, suggestions for, (49) 96.

farm surveys, (44) 697.

gardens, plans, (42) 738.

improvement—see also Rural community.

organizing for, address, (42) 291.

Life Campaign in Virginia, (49) 295.

life, church cooperation in, (45) 897.

needs, diagnosing, (49) 596.

organization, (43) 192; (46) 789.

survey at Ashland, (44) Mo. 89.

tile drainage organizations, (43) U.S. D.A. 478.

Community—Continued.

work among Pima Indians in Arizona,
(49) 894.

Comocritis pieria, life history notes, (45)
657.

Comparator, double-wedge, (45) 411.

Comparator, improved, (43) 503.

Complement—

absence in blood of insects, (41) 754.
deficiency, hereditary behavior, (50)
Vt. 328.

deficient guinea pigs, blood elements
in, (49) 880.

deficient serum, phagocytic index, (43)
274.

deviation for testing antianthrax sera,
(45) 682.

deviation reaction for dourine diag-
nosis, (44) 781; (45) 785; (46)
277.

deviation reaction in tuberculosis, (47)
386; (48) 879.

deviation reaction, polyvalent extracts
for, (43) 181.

deviation, studies, (43) 382.

deviation test for contagious pleuro-
pneumonia, (46) 883.

deviation test for glanders, (44) 579,
779.

fixation—

and dourine, (46) 774.

methods for biological prepara-
tions, (47) 881.

quantitative relation between com-
plement, (45) 681.

rate at various temperatures, (45)
681; (46) 276; (48) 177.

reaction, studies, (48) 880.

test as affected by previous mallein
test, (43) 881.

test for glanders, (42) 379. 380.

test for tuberculosis, (43) 278,
687; (44) 279; (45) 77; (46)
482; (47) 682; (49) 883.

test, germ-free filtrates as anti-
gens, (44) 76.

test in pulmonary tuberculosis,
(44) 376.

test, standardization, (44) 480.

test, value in identifying *Bacillus*
botulinus, (50) 64.

tests, optimum amount of antigen
in, (48) 177.

fixing antibodies in normal horses.
(50) 383.

inactivation by bacteria, (41) 376.

influence on precipitates, (41) 186.

loss in serum as affected by tempera-
ture, (41) 477.

of animals, constitution of, (43) 684.
preservation, (41) 186.

production as affected by deficient
nutrition, (41) 574.

regeneration, after radiation or heat-
ing, (43) 781.

titration of, (43) 780.

Comptonotus pennsylvanicus injuring cedars,
(41) 63.

Compositae, activation of buds, (41) 818.

Compositae, variations in sex, (45) 629.

Composites, apogamy and hybridization in,
(48) 729.

Composites, reversion in, (47) 325.

Compost, use on meadows, (50) 434.

Composts, preparation and use, (42) 721.

Compsilura concinnata, studies, (41)
U.S.D.A. 461; (42) 52; (45) U.S.D.A.
154; (48) 158; (49) 555.

Compsilura spp., parasitism by, (46) 457.

Compsocryptus retentor, notes, (50)
U.S.D.A. 258.

Concrete—

abrasion test, (46) 284.

aggregates producing equal strength,
(43) 482.

aggregates, proportioning with pit run
gravel, (44) 483.

and steel, bond between, (42) 486.

apparatus for measuring wear of, (42)
U.S.D.A. 83.

appearance, effect of alkali, (47) Wyo.
189.

ball test for, (46) U.S.D.A. 285.

beams, reinforced, tests, (43) 482.

bins, circular reinforced, design, (43)
892.

bituminous, bitumen content, (43) 389.

block, slump test, making, (44) 884.

blocks, manufacture and use, (43) 86.
brick masonry, characteristics, (47)
686.

bridges, impact tests, (42) 485.

bridges, reinforced, design, (44) 85.

bridges, reinforced, specifications, (42)
579.

buildings, small, construction, (43)
188.

burnt earth, reinforced with iron and
wood, (42) 585.

central-plant-mixed, maximum haul,
(46) U.S.D.A. 488.

chemistry of, (42) 386.

compression tests, (41) 884; (44) 483.

consistency, apparatus for determin-
ing, (43) 86.

consistency, measuring by flow table,
(43) 590.

constituents, estimation, (49) 588.

construction, treatise, (41) 584; (43)
889; (46) 688.

cooling, in freezing weather, (46) 488.

curbs and gutters, construction, (43)
90.

dams for checking soil erosion, (45)
21.

designers' manual, (46) 85.

dipping tanks, construction, (42) 779,
786; (43) 90.

drain tile, effect of organic decomposi-
tion products, (49) 790.

drain tile, stresses in, (47) 388.

effect of alkali, (44) U.S.D.A. 586,
883; (45) 689.

Concrete—Continued.

effect of boiling water on, (46) 283.
 effect of oven drying, (46) 283.
 effect of salts, (48) 682.
 effect of various substances on, (42) 581.
 effect of vibration and pressure on, (42) 583.
 electrolysis in, (42) 281.
 engineers' handbook, (42) 580.
 farm buildings, (43) 90.
 fatigue of, (50) 790.
 fence posts, studies, (43) Ohio 391; (49) Iowa 788.
 fences and gateposts, (43) 188.
 floors, construction, (43) 188.
 forms, pressure formula, (42) 890; (43) U.S.D.A. 388.
 freezing, protection against, (49) 385.
 grain bins, loading test, (42) 787.
 greenhouses, construction, (43) 90.
 hotbeds, construction, (43) 90.
 house building details, (49) 87.
 houses, construction, (44) 588; (45) 84.
 in alkali soils and waters, (44) 286.
 in alkali soils, deterioration, (46) 85; (48) 884.
 in alkaline water, disintegration, (47) 887.
 in peat soils, disintegration, (47) 687.
 integral waterproofings for, (49) 286.
 laboratory tests, (42) 890.
 limestone-asphalt aggregate, (41) 884.
 linings for irrigation canals, (47) 87.
 long-distance wet haulage, (42) 685.
 manufacture and use, treatise, (49) 484.
 methods of curing, effect on compressive strength, (42) 889.
 mixing and laying, (43) 889.
 mixing and use on the farm, (50) 187.
 mixtures, excess sand in, (46) 487.
 mixtures in alkali soils, (43) 482.
 modulus of elasticity. relation to strength, (42) 889.
 moisture content, effect on expansion and contraction, (46) 888.
 molded and core, relation, (46) 780.
 new and old, bonding, (41) U.S.D.A. 382.
 pavements, classes, (42) 385.
 pavements, design, (42) 891.
 pavements, design and construction, (42) 579; (48) U.S.D.A. 287.
 pavements, impact tests, (46) U.S.D.A. 285.
 pavements, mileage tests, (42) 578.
 pavements, reinforcing, (43) 790.
 pavements, tests, (42) 385; (45) U.S.D.A. 489.
 pavements, vertical movements, (41) 689.
 paving bases, plain and reinforced, compared, (47) 888.
 paving costs, charts, (42) 685.

Concrete—Continued.

permeability of, (42) 685.
 pig houses, construction, (43) 90.
 pipe, precast lock-joint, manufacture and installation, (48) 287.
 pipe, reinforced, design, (50) 86.
 pipe, use in irrigation, (44) U.S.D.A. 783.
 pipe, water flow in, (44) U.S.D.A. 185.
 plain, for farm use, (48) U.S.D.A. 287.
 poultry houses, construction, (43) 90.
 pressure against forms, U.S.D.A. (43) 388, 389.
 products, manufacture and use, treatise, (50) 186.
 proportioning and mixing, (47) 686.
 proportioning, surface area method, (42) 888.
 protecting against fire, (42) 890.
 quality as affected by fineness of cement, (42) 781.
 quantities of materials for, (47) 686.
 quick-hardening, composition, (42) 889.
 reinforced, construction, (43) 188.
 reinforced, construction, treatise, (42) 580, 685; (43) 289; (48) 682; (50) 485.
 reinforced, design tables, (42) 581.
 reinforced for rural structures, (42) 187.
 reinforcement with cast iron, tests, (42) 584.
 road aggregates, testing, (41) 484, 789.
 road and bases, experimental, (44) 885.
 road film, new, (44) U.S.D.A. 586.
 road finisher, description, (43) U.S.D.A. 388.
 road slabs, U.S.D.A., (41) 381; (44) 586.
 roads, alkali attack on, (47) 590.
 roads, available aggregates, (43) 284.
 roads, construction in Michigan, (42) 483.
 roads, construction, treatise, (50) 587.
 roads, construction, use of calcium chlorid in, (47) 188.
 roads, contraction and expansion, (48) 884.
 roads, development, (42) 578.
 roads, heavy tonnage test, (48) 588.
 roads, impact tests, (42) 485.
 roads, reinforced, construction in Great Britain, (42) 579.
 roads, reinforced, design and construction, (43) 284.
 roads, reinforced, experimental, (44) 885.
 roads, reinforced, factors affecting design, (43) 284.
 roads, reinforced, use of mesh in, (42) 781.
 roads, reinforcement, determining position of, (43) 284.

Concrete—Continued.

- roads, resurface, (45) U.S.D.A. 82.
 - roads, selection of materials for, (47) 90.
 - roads, specifications for, (42) 485, 579.
 - roads, tractive efficiency, (41) 584.
 - roads, use of old macadam in, (42) 891.
 - roads, use of slag in, (42) 781.
 - roads, use of wet-batch hauled concrete, (42) 684.
 - roads, value of reinforcement, (42) 578.
 - root cellars, construction, (43) 90.
 - sand and water for, measurements, (49) 285.
 - sand, colorimetric test, (48) 286.
 - saturation tests, (41) 884.
 - selection of materials and mixing, (43) 186.
 - sidewalks, construction, (43) 90, 188.
 - slabs, effect of repeated loads, (50) 186.
 - slabs, precast, for irrigation structures, (43) 587.
 - slag, stone, and gravel, absorption tests, (41) 584.
 - solubility and hydration, (42) 581.
 - stave silos, tests, (44) 689.
 - steps and stairs, reinforced, design, (44) 486.
 - stone screenings as aggregate for, (49) 384.
 - strength, (50) 385.
 - strength, effect of age, (45) 891.
 - strength, relation to aggregate strength, (47) 590.
 - structures, methods of construction, (46) 585.
 - tanks and cisterns, construction, (43) 188.
 - tanks, reinforced, construction, (47) 489.
 - tanks, stock-watering, construction, (47) 392.
 - tension, tests, (42) 581.
 - tentative specifications for, (46) 888.
 - test highway, movements in, (46) 780.
 - thermal conductivity and diffusivity, (46) 381.
 - tile, durability in alkali soils, (48) 184.
 - tile, efficiency, (45) Wis. 289.
 - tile in peat, durability, (47) 687.
 - tile, testing, (41) 786.
 - troughs, construction, (43) 90.
 - use of calcium chlorid in, (42) 582.
 - walls, construction, (43) 188.
 - walls, retaining, design and construction, (43) 485.
 - wells, construction, (43) 90.
 - work, treatise, (44) 784.
- Condensed milk, *see* Milk.
- Condenser, new type, description, (42) 612.
- Condensers, descriptions, (41) 311, 615.
- Condensers, types compared, (43) 112.

- Condiments, chemistry of, treatise, (43) 609; (49) 559.
- Condol, culture directions, (45) 35.
- Conductivity and permeability, (47) 522.
- Conductivity of colloidal mixtures as affected by chlorid ions, (41) 631.
- Conductivity of living tissue, (41) 819.
- Conductivity of plants under geotropic stimulation, (41) 725.
- Confectionery, colloid chemistry of, (41) 310.
- Confectionery, methods of investigation and standards, (41) 558.
- Conglutination test for glanders, (44) 779.
- Congress of Cereals, proceedings, (49) 736.
- Coniferous—
 - chlorosis, control, (45) 250.
 - forests, nitrification of soils and regeneration, (41) 125.
 - needles, development and contents, (42) 225.
 - nursery, fertilizer experiments, (50) 443.
 - nursery stock, snow molding in, (49) 755.
 - rusts, notes, (43) Pa. 552.
 - seed industry, (42) 739.
 - seedling disease, (47) 749.
 - seedling, mold of, (43) 846.
 - seedlings, damping-off disease, (42) Calif. 839; (45) U.S.D.A. 357; (50) Minn. 49.
 - seedlings, effect of shading, (50) 443.
 - seedlings, lenticel hypertrophy, (44) 650.
 - seeds, characteristics, (47) 747.
 - seeds, germination, (50) 343.
 - seeds, storage, (47) 145.
 - seeds, viability, (45) 540.
 - spinning mite, notes, (48) 556.
 - timber, bluing of, (49) 447.
 - wood, sawdust gelatinization, (50) 509.
 - woods and hardwoods, distinguishing, (47) 443.
 - woods, durability, laboratory tests, (48) 352.
 - woods, penetration by preservatives, (41) 819.
 - woods, proximate analysis, (41) 14.
- Conifers—
 - American, chemistry of, (42) 7.
 - as affected by emanations from munition plants, (43) 347.
 - bud relation to trunk growth, (49) 28.
 - characteristics of, (43) 650.
 - classification and characteristics, treatise, (45) 45.
 - dwarf and slow-growing, treatise, (50) 242.
 - eccentric growth and redwood in, (45) Vt. 819.
 - for shelter belts, (41) U.S.D.A. 840.
 - frost rings in, formation, (48) U.S.D.A. 729.
 - fungi affecting, (48) 249.

Conifers—Continued.

- gas injury to, (46) 128.
 heart rots, (46) 454; (48) Can. 51.
 in British Isles, rate of growth, (43) 748.
 inhibitory action on nitrogen fixation, (45) Idaho 213.
 injury near manufacturing plants, (41) 846.
 mycorrhizas on, (48) 725.
 ontogeny of cotyledons in, (43) 133.
 pathological resin canals in, (50) 753.
 rabbit injury to, (46) 447.
 reforestation, treatise, (41) 652.
 reproduction in New England, (48) 41.
 soil acidity preference, (47) 442.
 time for transplanting, (43) Mo. 142.
 transpiration, (41) 329.
 transpiration, device paralleling, (41) U.S.D.A. 725.
 treatise, (41) 244; (50) 344.
 treatment of earth about roots for Japanese beetle, (46) 251, 252.
 winter browning, (46) 454.
Coniophora cerebella, studies, (44) 27.
Coniophora, studies, (42) 147.
Coniothecium chomatosporum, notes, (44) 445; (45) 48.
Coniothyrium—
 berlandieri, notes, (49) 45.
 convolutum n.sp., description, (46) 243.
 cydoniae mali n.var., (46) 243.
 hellebori, notes, (46) 44.
 spp., notes, (43) 753; (47) 547.
Conisporium arundinis, description, (49) 445.
Conistra walkeri, studies, (41) 357.
 Connecticut—
 College, notes, (42) 197; (44) 395; (46) 298, 699; (49) 98.
 State Station, notes, (41) 199, 398, 496, 700, 798; (45) 95, 900; (46) 394, 499; (48) 600, 695; (49) 299, 899.
 State Station, report, (44) 393; (46) 697; (48) 193; (50) 696.
 State Station, report of director, (46) 598; (49) 696.
 Stations, notes, (46) 298, 395, 794; (49) 98.
 Storrs Station, report, (43) 197; (44) 195.
Conocephalus fasciatus, parasite of, (48) 360.
Conofilippia, new genus, erection, (45) 255.
Conogethes punctiferalis on maize, (41) 57.
Conopholis, protein bodies in, (47) 223.
Conorhinus megistus, notes, (43) 182.
Conotrachelus—
 aguacatae n.sp., description, (50) 458.
 crataegi, *see* Quince curculio.
 juglandis, *see* Walnut curculio.
 nenuphar, *see* Plum curculio.
 perseae n.sp., description, (41) 260.
 perseae, notes, (47) U.S.D.A. 157.

Conotrachelus—Continued.

- sapotae* n.sp., description, (50) 458.
 spp., studies, (47) U.S.D.A. 556.
 Conserves, recipes, (47) 113.
 "Constant," use of term, (43) 867.
Constrictotermes, notes, (43) 256.
 Construction equipment, handbook, (47) 189.
Contarinia—
 gossypii, control, (49) V.I. 353.
 piri, notes, (42) 249.
 tritici, *see* Wheat midge.
 Contractors' and estimators' reference book, (43) 188.
Conurus, new, description, (41) 353.
Convolvulaceae, witches' broom on, (44) 343.
Convolvulus, Japanese, inheritance in, (47) 524.
 Cookbook for meatless diet, (41) 68.
 Cookery, experimental, principles, (44) 660.
 Cookery, home, use of gas for, (49) 57.
 Cookies, analyses, (47) Calif. 660.
 Cooking—
 and sewing, elementary courses, (47) 598.
 by electricity, (41) 587; (47) 764; (50) 58.
 camp, (47) 764.
 emergency, for large groups, manual, (42) 863.
 equipment, camp, construction, (42) 458.
 for invalids, lessons, (45) 697.
 gas consumption in, (44) 664.
 laboratories, arrangement, (44) 392.
 manual, (42) 458.
 recipes, (46) 96.
 temperatures, standardization, (45) Mo. 261.
 textbook, (43) 494; (45) 93, 399.
 Cooperage stock production, (42) U.S.D.A. 349.
 Cooperation, *see* Agricultural cooperation.
 Cooperative—
 advertising, value, (45) 396.
 association law of Maryland, (48) 792.
 associations, legal phases, (48) U.S.D.A. 189.
 grain elevator companies, (43) U.S.D.A. 895.
 marketing, *see* Marketing.
 milk societies in Calcutta, (43) 177.
 organizations in Italy, (44) 191.
 shipping and selling, fundamentals, (47) 866.
 societies for housing in India, (49) 191.
 societies in Burma, (43) 94.
 societies in Coorg, (45) 897.
 societies in Europe, (48) 792.
 societies in India, (47) 298.
 societies in the Punjab, (50) 795.
 societies, law for incorporation, (44) 691.
 Cooperia spp., notes, (49) La. 283.

Copepoda, collection of in Honduras, (42) 847.

Copernicia seed products, analyses, (47) 16.

Copidosoma—
 gelechia, notes, (41) 854.
 gelechia, polyembryonic broods, studies, (42) 656.
 sp., parasitism by, (45) 256.
 tortricis n.sp., description, (44) 460.

Copper—
 absorption by potato, (45) 733; (46) 324.
 acetate, adhesiveness, N.H. (43) 842; (49) 349.
 acetate, conservation, (46) 745.
 acetates as fungicides, (48) N.H. 544.
 acetates, properties and cost, (43) 155.
 aceto-arsenite of, new preparation, (47) 758.
 and arsenic, iodometric determination, (47) 15.
 and mercury compounds, stimulating action on urine, (44) 215.
 antitoxic properties of calcium toward (45) 29.
 arsenic dust, insecticidal value, (45) 45.
 arsenic dust, value, (46) 846.
 as antitoxic to plants, (45) 29.
 bactericidal action, (45) 74.
 carbonate dust, use, (49) Oreg. 538; (50) Minn. 144.
 carbonate for wheat smut control, (42) 245; (47) 245; (48) Oreg. 243; (49) 645; (50) Calif. 44, 347, 649.
 carbonate, fungicidal value, (44) 343; (46) 846; (49) 646.
 carbonate solution for invert sugar determination, (42) 416.
 carbonate v. copper sulphate for smut control, (49) Idaho 746.
 compounds, effect on corn, (44) 326.
 determination, (44) 11; (48) 412.
 determination, new method, (47) 610.
 distribution and movement in plants, (44) 825.
 dust, (41) 354.
 dust, for stiking smut, (49) Mich. 841.
 effect on grape downy mildew, (47) 153.
 favorable action on plants, (45) 29.
 fungicides, composition and use, (43) 155.
 fungicides, national problem, (47) 647.
 fungicides, relative adhesiveness, (43) N.H. 842.
 in cultivated soils, (42) 423.
 in dairy products, solubility, (50) 178.
 in food material of plant origin, (44) 62.
 in food materials, (42) 758; (45) 665.
 in fungicidal sprays, (48) 740; (50) 245, 446.
 in fungicidal sprays, behavior, (47) 250, 546.

Copper—Continued.

in gelatin, determination, (50) 712.
 in human brain, (46) 861.
 in human organs, (42) 758.
 in marine organisms, (44) 556; (49) 258.
 in oysters, (41) 465.
 iodometric determination, (45) 111.
 lime dust, fungicidal value, (48) Va. 547.
 nontoxicity for downy mildew, (48) 456.
 nontoxicity for fungi, (45) 49.
 nontoxicity of, (48) 148.
 omission from Bordeaux mixture, (47) 546.
 oxid, insecticidal value, (49) U.S.D.A. 449.
 rôle in Bordeaux mixture, (48) 144.
 salts, effect on bacteriological analysis of water, (49) 285.
 soap dust, use as fungicide, (48) 645.
 soap mixture, fungicidal value, (43) 846.
 spray coatings, field testing, (41) U.S.D.A. 144.
 sprays, acid and alkaline, (41) 54, 349.
 sprays, action on vegetation, (41) 751.
 sprays as affected by rain, (45) 49.
 sprays, effect on yield and composition of potatoes, (49) U.S.D.A. 247.
 sprays, preparation, (43) 544; (47) 250.
 sprays, studies, (41) 249, 349.
 stearate, fungicidal value, (41) 841; (42) 146.
 stearate, tests, (45) 146.
 sulphate—
 and soap mixture, fungicidal value, (41) N.J. 52.
 and tobacco, ascaricidal value, Okla. (45) 478; (47) 85.
 anthelmintic value, (49) Mich. 80.
 as soil disinfectant, (42) 718.
 dust, dehydrated, use, (50) Minn. 148.
 dust, fungicidal value, (44) 343.
 effect on activity of amylases, (46) 707.
 effect on alkali salts, (42) Calif. 813.
 effect on almond roots, (44) Calif. 743.
 effect on grain, relation to condition of seed coat, (45) 245.
 effect on wheat, (47) Oreg. 148; (50) Calif. 43.
 emulsion and soap, fungicidal value, (44) 645.
 for algae growths, (43) 479; (47) 590.
 for cereal seed treatment, (45) 542.
 for cereal smuts, (42) Calif. 47.
 for charlock eradication, (46) 37.

Copper—Continued.

sulphate—continued.

for conservation of liquid manure,
(42) 721.

for destruction of snails, (44)
582.

for stomach worms in sheep, (49)
N.C. 787.

for wheat smut control, (45)
Wash. 242; (47) 245.

fungicidal value, (43) 346.

in chick feed, value, (45) Ind. 172.
solution for smut control, (50)
347.

tests, (45) 146.

treatment of barley, tests, (49)
840.

use against weeds in coniferous
nurseries, (43) 42.

v. copper carbonate for smut con-
trol, (49) Idaho 746.

tacks, use in control of wood-rotting
fungus, (49) Oreg. 539.

wire, effect on trees, (48) 433.

Copper-magnesium alloy, use in nitrogen
determination, (45) 206.

Copra—

cake—see also Coconut cake.

extraction with solvents, (48)
112.

feeding value, (50) 367.

meal, analyses, (41) Conn.State
176.

disease, notes, (43) 151.

drying method, (42) 12.

exports, (46) Guam 734.

industry in Cochin China, (41) 540.

industry in Guam, (42) Guam 37.

insects affecting, (45) 853.

making, methods, (45) Guam 43.

meal, analyses, (45) 501.

meal, composition, (46) 803.

meal, feeding value, (49) Guam 464.

production, (46) 636.

products, notes, (42) 12.

Coprinus sp. on beet seed, (45) 48.

Coprinus spp., parasitism of, (43) 750.

Coptocyclus clavata, notes, (41) Conn.State
159.

Coptocyclus clavata on chili, (41) N.Mex.
159.

Coptotermes formosanus, notes, (42) 851.

Corcyra cephalonica, studies, (41) U.S.D.A.
459.

Cordia spp., notes, (43) 555.

Cordite, use in agriculture, (45) 891.

Corecoris confluentus, notes, (41) Fla. 548.

Coriarachne versicolor, enemy of codling
moth, (45) 856.

Coriolus spp. on peach trees, (41) 157.

Coriolus versicolor, notes, (44) 648.

Corizus, North American species, (41) 551

Cork—

insulating value, (44) 588.

oak in Tunis, (50) 744.

production in Spain, (50) 40.

thermal conductivity, (49) 186.

Cormorants, under-water activities, (48)
51.

Corn—

aberrant chromosome behavior in, (47)
34.

absorption of calcium chlorid ions,
(48) 726.

absorption of water and nitrates, (49)
29.

acid content, relation to soil acidity.
(42) 424.

acidity determination, (42) 11.

acidity, relation to vegetative vigor,
(50) 328.

acreage and planting time, (44) P.R
433.

adaptability to soils, (47) Tenn. 632.

albinism, (44) Conn.State 150.

alcohol from, (47) 207.

amino acid content, (41) 367; (46)
504.

amount in ration for steers, (49) Ind.
267, Miss. 267.

analyses, (45) 775; (47) N.Y.State
172, Va. 823; (50) Oreg. 7.

ancestry of, (41) 437, 530, 727; (43)
222.

and alfalfa, labor conflict between,
(41) U.S.D.A. 435.

and cob meal, analyses, (41) N.Y.State
868; (43) N.J. 69, 672; (45) Tex.
68, N.J. 775, 872; (47) N.J. 570.

and corn growing, textbook, (50) 694.
and corn products, bibliography, (44)

4, 71.

and cottonseed meal, feeding value,
(50) Miss. 69.

and cowpeas, hogging down, (49) La.
272.

and cowpeas, intertillage, (49) Tex.
429.

and gluten feed, analyses, (46) 871.

and millet silage, analyses and digesti-
bility, (45) 468.

and oat chop, analyses, (41) Ind. 564.

and oats, analyses, (41) Can. 565;
(42) Mich. 63; (43) N.J. 69; (47)
N.J. 570.

and oats, feeding value, (46) Ill. 678.

and pigs, price relations, (43) U.S.D.A.
694.

and sorghum, relative water require-
ment, (50) Kans. 28.

and soy beans as silage crop, (44)
R.I. 33.

and soy beans, culture experiments,
(47) Ohio 634; (50) Miss. 828.

and soy beans, feeding value, (50)
Miss. 70.

and soy beans for silage, (47) Ohio
634, Ark. 772.

and soy beans, hogging down, (43)
Ky. 871; (45) Mo. 271; (46) Mo.
364; (48) Ky. 171, Mo. 665; (49)
La. 272.

and soy beans, value, (49) Iowa 732.

Corn—Continued.

- and sunflower plants, comparative comparison, (45) 168.
- and sunflower silage, palatability tests, (45) 375.
- and sunflowers, growth, (48) N.Dak. 30.
- and tankage, feeding methods, (44) Ohio 472.
- and tankage, feeding value, (50) Miss. 69.
- and tankage v. rice polish and tankage for pigs, (50) Miss. 69.
- and teosinte, hybridization experiments, (41) 437.
- anomalies in, (47) 326, 749.
- antineuritic vitamin in, (41) 466.
- aphid, natural control, (41) 62, 852.
- aphid, notes, (45) V.I. 150; (46) Guam 748.
- aphid, transmission of mosaic by, (44) 49.
- as affected by alkali salts, (41) 623.
- as affected by aluminum, (47) Ind. 147.
- as affected by ammonium sulphate, (47) Mass. 218.
- as affected by borax, (44) 516; (45) Ind. 121, 426, 625; (46) 123, Conn.State 322; (47) N.H. 423; (48) N.J. 325; (49) U.S.D.A. 325.
- as affected by cane mosaic, (49) 539.
- as affected by cyanamid, (50) U.S.D.A. 622.
- as affected by humogen, (44) 128.
- as affected by iron, (44) 326; (47) Ind. 147.
- as affected by iron and aluminum salts, (49) 519.
- as affected by phosphatic slag, (47) 26.
- as affected by phos-pho-germ, (45) 817.
- as affected by sulphur, (50) Oreg. 724.
- as affected by superphosphate, (47) Minn. 124.
- as affected by weather, (41) U.S.D.A. 716, U.S.D.A. 810; (44) U.S.D.A. 119; (47) Minn. 116.
- as dry farm crop, Ariz. (41) 29; (43) 733.
- as forage crop, (41) Ariz. 332, Minn. 387, Nebr. 434, Can. 528; (43) 527, Mont. 739; (49) Mont. 430.
- as hay crop, (42) Mich. 631.
- as silage crop, (41) Kans. 34, N.Dak. 139, Nev. 227; (42) Wash. 828; (47) N.H. 429, Va. 823.
- as silage crop, irrigation experiments, (41) Nebr. 433.
- as silage crop, seed selection, (41) N.J. 35.
- as supplement to alfalfa pasture, (42) U.S.D.A. 374.
- as trap crop for cotton bollworm, (43) 852.

Corn—Continued.

- as wheat substitute, (44) U.S.D.A. 761.
- assimilation of nutrient salts, (45) 628.
- assimilation of phosphoric acid by, (44) 722.
- bacterial disease, notes, (47) Ark. 748.
- bacterial root and stalk rot, (47) 243; (48) 546.
- bacterial wilt, insect dissemination, (50) 747.
- bags, loading in freight cars, (46) 586.
- barium in, (46) Colo. 29.
- beetles, poison bait for, (43) 456.
- belt, agricultural conditions in, (47) 296.
- belt, location as affected by inclination of earth's axis, (43) 207.
- Belt Meat Producers' Association, report, (47) 866.
- billbug, studies, (42) Kans. 855.
- birder, tests, (42) 186.
- bollworm affecting, (43) Conn.State 252, Mo. 757; (46) Mo. 350.
- book for young folk, (45) 92.
- borer, European—
 - and sugar cane moth borer, comparison, (47) 55.
- conference, (47) 757.
- control, (41) Mass. 256; (42) 159; (43) 661, Mo. 759; (48) U.S.D.A. 554; (49) Ohio 352.
- discussion, (43) 162.
- distinguishing characters, (42) 250; (43) 661.
- in Canada, (44) 249; (46) 51, 247.
- in Canada and United States, (48) 252.
- in imported broom corn, (43) 161.
- in New York State, (41) 60; (45) 154; (47) 852.
- in Ontario, (45) 759; (48) 155; (49) 155, 848.
- in Russia, (49) 356.
- introduction into America, (44) 551.
- life history, (43) 661; (47) 852.
- life history in Ontario, (48) 852.
- new synonymy, (45) 255.
- notes, (41) Conn.State 159, Mich. 660, 665; (42) 159, 250, 361, Ohio 496; (43) Mich. 660, Mo. 759; (44) 249, Mass. 453, Mich. 853; (45) Conn.State 149; (46) Guam 748; (47) 550, 852; (48) U.S.D.A. 52; (50) Conn. State 50, 51.
- paper on, (44) 851.
- parasite of, (43) 858; (46) 57; (47) 555, 762; (48) 854.
- present status, (43) Conn.State 251.
- quarantine regulations, (46) Ohio 750.
- resolutions concerning, (50) 155.

Corn—Continued.

- borer, European—continued.
 situation in America, (43) 661.
 species, (42) 361.
 spread in Ontario, (47) 852.
 summary, (41) Conn.State 159,
 257, U.S.D.A. 257, Ohio 552;
 (45) U.S.D.A. 759, 855; (50)
 Ill. 357.
 survey, (45) 454, 852.
 vacuum fumigation experiments,
 (49) 654.
- borer, lined, notes, (44) N.J. 349.
- borer, native, life history, (46) Iowa
 349.
- borer, native, occurrence, (44) Iowa
 452.
- bran, analyses, (41) Ind. 564, Can. 565,
 Ind. 868, N.Y.State 868; (42) 263,
 560, Tex. 769; (43) Ind. 69, Ky.
 373, 867, Ind. 867; (45) Tex. 68.
 N.Y.State 469, 872; (46) Tex. 675;
 (47) 275, Ind. 473, N.J. 570.
- bran, digestibility and productive
 value, (47) Tex. 472.
- bran, digestion coefficients, (42) 263.
- bran, feeding value, (41) Mass. 276.
- breeding and selection, (47) La. 428;
 (48) Hawaii 330.
- breeding experiments, (41) N.J. 42,
 436, U.S.D.A. 437, 636, N.C. 638, 733,
 747, 827; (42) S.Dak. 33, Minn.
 338, Minn. 731, Minn. 824, Minn.
 826; (43) Ind. 331, 529, 637; (44)
 Kans. 224, Minn. 331, 526, 828; (45)
 Guam 34, N.Dak. 225, 341, Nebr.
 531, 632, 734; (46) S.C. 725, Guam
 726; (47) Miss. 227, Minn. 331,
 N.Y.Cornell 334, Nebr. 735; (48)
 N.Dak. 30, Nebr. 131, Mich. 224,
 P.R. 227, S.C. 629; (49) Miss. 428,
 Idaho 732; (50) Minn. 132, Wis.
 435, P.R. 533, S.C. 637.
- breeding for cold resistance, (42) Wis.
 337.
- breeding in Egypt, notes, (44) 500.
- breeding in Italy, (50) 333.
- breeding, methods, (42) S.Dak. 231;
 (43) 529; (48) 334.
- breeding, use of greenhouse in, (47)
 335.
- broken ear v. shelled for steers, (46)
 Ky. 367.
- brown spot, notes, (43) 243; (44)
 U.S.D.A. 446.
- brown-husked type, identification of
 pigments, (46) 125.
- butyric fermentation, gases from, (50)
 12.
- canned, bacterial flora, (46) 859.
- canned, black discoloration in, (47)
 164.
- canned, effect of lemon juice on, (42)
 Calif. 863.
- canned, spoilage in, (45) Mich. 261;
 (49) Colo. 412.
- canned, standards for, (46) 15.

Corn—Continued.

- canned, thermophilic organism from,
 (44) 62.
- cannery refuse, digestibility, (44) 868.
- canning, recipe, (43) 808.
- canning studies, (46) U.S.D.A. 664.
- Cebu, yields, (48) 830.
- chinch bug resistant varieties, (45)
 152.
- Chinese, inheritance of aleurone color
 in, (41) 733.
- chlorin determination, (42) 506.
- chlorophyll factors, (45) 524.
- chlorophyll types, cytology of, (49)
 423.
- chlorosis, studies, (41) 347.
- chop, analyses, (42) Tex. 769; (43)
 Ky. 373; (44) Mich. 568; (45) Tex.
 68, 872; (46) Tex. 675; (47) Ind.
 473, Tex. 474, Tex. 475.
- chromosome number, (45) 222.
- climatic requirements, (41) U.S.D.A.
 417.
- cobs, chopped, composition and digesti-
 bility, (43) 267.
- cold-resistant by germinating in ice
 box, (47) Wis. 432.
- cold-resistant variety, (44) Wis. 226.
- commercial outlook, (50) 594.
- composition, (44) 359.
- cooperative tests, (49) Iowa 732.
- cost and price indexes, (43) Mo. 792.
- cost of cultivating with motor culti-
 vator, (48) Mo. 681.
- cost of production, (41) Minn. 91;
 (42) Mo. 188; (43) Ohio 392; (44)
 N.Dak. 88, N.Dak. 190; (45) 191;
 (46) Mo. 387, 590; (47) Mo. 192;
 (48) U.S.D.A. 289; (49) N.Y.Cor-
 nell 691.
- cost of production in Africa, (46) 89.
- cost of production in Argentina, (43)
 487.
- cost of production in 1920, (44) 790.
- cracked, analyses, (45) 872.
- cribbed, air-drying, (41) Iowa 227.
- crinkly leaf, inheritance, (49) 632.
- crop, importance, (48) U.S.D.A. 289.
- crosses, effects of selection on yield,
 (50) U.S.D.A. 830.
- crosses, reciprocal, inequality of, (45)
 36.
- cultivation experiments, (46) Kans.
 435, Ky. 832.
- culture, (41) Ga. 31, Kans. 32, Kans.
 34, Ind. 232, 333, Mo. 637, Nebr.
 638, 729, N.Dak. 824, 825; (42)
 132, 436, Va. 436, N.Dak. 732; (43)
 Tex. 33, U.S.D.A. 134, Ky. 331,
 Mont. 332, Ariz. 733, Mo. 736, Mont.
 738; (44) N.Dak. 88, V.I. 332, P.R.
 433, Utah 525, 526, 827, Mich. 828;
 (45) 34, N.Dak. 226, Mont. 339,
 340, 630, 631, Mo. 633, N.Dak. 734;
 (46) 131, 436, 634; (47) N.J. 34,
 N.Mex. 333, N.C. 527, Ark. 733,
 Iowa 734; (48) N.Dak. 30, N.Mex.

Corn—Continued.

culture—continued.

- 133, N.Dak. 225, V.I. 340, Ariz. 434;
(49) Mont. 130, 329, Miss. 428, Tex.
429, U.S.D.A. 630, Can. 734; (50)
828.
- culture—
among Indians of Southwest, (46)
532.
experiment station in Italy, (46)
832; (47) 195.
in Argentina, (42) 530; (47) 31.
in Brazil, (42) 438.
in British Columbia, (42) 733.
in Burma, (41) 529; (42) 436.
in lead and zinc regions, (43) 513.
in Morocco, (49) 595.
in New South Wales, (45) 738.
in St. Vincent, (41) 528.
in South Africa, (41) 528.
in Southeastern States, (44)
U.S.D.A. 138.
in Sweden, (50) 735.
in Uganda, (42) 32.
old and new, (41) U.S.D.A. 649.
on peat soil, (46) 216.
on sandy soils, (41) Wis. 18.
teaching methods, (42) 298.
under dry farming, (49) Nebr.
527.
with velvet beans, (48) Ga. Coastal
Phila 128.
cytological studies, (42) 432.
damage from various causes, (44)
U.S.D.A. 118.
demonstrations, results, (49) La. 890.
dent, origin, (50) 234.
deterioration in, (42) 608, 761.
digestibility coefficients, (48) 574.
Diplodia infected, poisonous to cattle,
(45) 583.
disease in Java, (47) 751.
disease survey in India, (46) 544.
disease susceptibility, segregation, (41)
747.
diseases, (43) Ind. 345, Tex. 845; (44)
Iowa 444; (45) 444, 542, 649; (49)
Ind. 537.
diseases affecting germination, (46)
Del. 646.
disking v. plowing, (43) Mont. 739.
double kernel in, morphology, (50)
N.Y.Cornell 24.
downy mildew in Philippines, (43) 545.
dry rot, notes, (47) 350; (49) Iowa
746; (50) Iowa 145.
ear and root parasite, (50) 548.
ear, black mold, control, (46) Tex.
343.
ear characters, (46) Mo. 332.
ear, evolution, (45) 36.
ear mold, notes, (45) Tex. 50; (47)
Iowa 749.
ear, samples, preservation, (47) 34.
ear structure, evolution, (41) 436;
(44) 629.

Corn—Continued.

- ears, abnormal, significance, (41) 530.
ears, carbohydrates, effect of desicca-
tion methods, (49) 10.
ears, physical characters, (41) Del.
137.
ears, well-filled v. poorly filled, repro-
ducing power, (45) 36.
earworm in alfalfa, control, (48) 358.
earworm, notes, (41) 665; (44) Kans.
249, V.I. 351; (45) 457, 759; (48)
Mass. 650, U.S.D.A. 854; (50) 51,
546.
earworm on vetch, control, (45)
U.S.D.A. 360.
earworm, oviposition, (43) 358; (48)
651.
earworm resistant variety, (50) V.I.
533.
earworm, structure of larvae, (44) Ky.
550.
earworm, summary, (47) Conn.State
156.
earworm, wintering, (50) Conn.State
50.
effect of preceding crop, (45) 534;
(48) N.Dak. 225.
effect on following crop, (41) N.Dak.
823; (44) Mont. 331; (45) N.Dak.
226; (46) U.S.D.A. 130; (49) 231,
Ohio 329, Nebr. 527.
effect on soil acidity, (47) 723.
effect on soil nitrate, (41) Mo. 623,
812.
effect on water extract of soil, (44)
749.
embryo, germination, (44) 221.
endosperm defects, (49) 826.
energy value, (47) 69.
experiments, contradictory results,
(41) 436.
export, carrying quantities, (41)
U.S.D.A. 438.
exports from Argentina, (43) 95.
exudate water from, solids in, (49)
N.Y.Cornell 520.
following experiments, (45) U.S.D.A.
531.
families of South Dakota, (42) S.Dak.
234.
farm and market prices, (48) U.S.D.A.
92.
fat, digestibility coefficients, (47)
U.S.D.A. 569.
fertilization and gametogenesis, (41)
726.
feed acid, analyses, (41) Conn.State
476, Ind. 564, R.I. 564, Ind. 868,
N.Y.State 868; (42) Mich. 63, 263,
560, Ind. 769, Tex. 769, Mass. 866;
(43) Ind. 69, N.J. 69, Ky. 373, N.J.
672, 867, Ind. 867; (44) Mich. 568;
(45) N.Y.State 469, 872; (46) Mich.
168, (47) N.Y.State 172, 275, Ind.
473, N.J. 570.
feedlot value, (50) Ohio 170.

Corn—Continued.

- feeds, comparative value, (47) Iowa 782.
- fertilizer and bean test, (47) Miss. 428.
- fertilizer experiments, (41) Mass. 21, N.Y.Cornell 21, Ga. 31, Kans. 32, Ark. 130, Del. 136, N.Dak. 139, Ohio 140, Fla. 527, Mo. 626; (42) Va. 21, 22, 123, 132, 230, Mass. 326, N.Y.State 326, Wis. 327, 436, Va. 436, Ohio 636, Minn. 731, Ala.Col. 822; (43) Tex. 33, S.C. 126, Ala.Col. 135, Tex. 229, Ala.Col. 333, 423, N.C. 424, N.C. 427, Ohio 726, Ky. 824; (44) R.I. 21, Hawaii 29, 31, 32, Kans. 225, Minn. 321, Del. 431, 813; (45) 34, Miss. 37, Ala.Col. 119, Ill. 121, Ohio 126, Miss. 129, Miss. 223, Ohio 232, 534; (46) Mass. 19, 131, Mich. 518, 634, 817; (47) S.C. 24, Wash. 124, Miss. 217, Ga. 427, La. 428, Miss. 428, Ark. 519, N.C. 528, Miss. 735, 814; (48) 23, Ky. 129, N.Dak. 225, Minn. 321, Va. 333; (49) Miss. 32, 329, Miss. 428, Can. 734; (50) Minn. 129, Minn. 121, West.Wash. 520.
- fine streaked leaves, inheritance, (49) 632.
- flour, analyses, (42) Tex. 769; (48) Can. 368.
- flour, characteristics and detection, (41) 497.
- flour, effect on yeast activity, (41) 362.
- flour, or "gaudez," in France, (42) 255.
- flower anomalies, (41) 640.
- fodder, analyses, (42) Minn. 735.
- for fattening lambs, (44) Ohio 365.
- for fattening steers, (42) Nebr. 169.
- for finishing steers, (43) Ind. 869.
- for hogs, (42) Tex. 169.
- for silage, cost studies, (50) Can. 432.
- for silage, seedling experiments, (49) Idaho 732.
- for silage, shrinkage tests, (49) Ohio 733.
- for silage, variety tests, (49) Can. 734.
- fossil species from Peru, (41) 530.
- freaks of, (41) 530.
- freezing injury, (42) Nebr. 437.
- from Volga region, composition, (50) 169.
- fumigated, hydrocyanic acid absorption and retention by, (49) U.S.D.A. 456.
- Fusarium disease, studies, (43) Mo. 749; (50) 648.
- Fusarium wilt in Iowa, (47) 244.
- genetical research with, (48) 630; (50) 430.
- geotropic bending, moisture changes, (44) 323.

Corn—Continued.

- germ meal, analyses, (41) Ind. 564, Ind. 868, N.Y.State 868; (42) Mich. 63, 769, Ind. 769, Mass. 866; (43) Ind. 69, Ind. 867; (44) Ohio 178, Mich. 568; (47) Ind. 473.
- germ meal, composition and feeding value, (47) 373.
- germ meal, feeding value, (44) Ohio 177; (47) 378.
- germ, nutritional value, (49) Ind. 573.
- germination, (41) 632.
- germination and growth, effect of *Gibberella saubinetii*, (44) 644.
- germination and growth, effect of seedling date, (46) U.S.D.A. 532.
- germination as affected by fertilizers, (44) Va. 721; (49) 122.
- germination as affected by H-ion concentration, (43) 525.
- germination as affected by organic substances, (41) 523.
- germination as affected by rolling of soil, (43) 722.
- germination, fertilizer injury to, (50) N.J. 215.
- germination tests, (42) Nebr. 437.
- glucose and starch from, (45) 416.
- glucose, determination, (44) 434.
- gluten feed, analyses, (41) N.H. 68, Conn.State 176, Ind. 564, R.I. 564, Can. 565, Ind. 868, N.Y.State 868; (42) 263, 560, 769, Tex. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, N.J. 672, R.I. 672, 867, Ind. 867; (44) Mich. 568, N.H. 671; (45) Tex. 68, N.Y.State 469, 872, R.I. 872, Vt. 872; (46) Can. 168, Mich. 168, N.H. 675, Tex. 675; (47) N.Y.State 172, 275.
- gluten feed, composition and retail prices, Conn.State, (45) 176, 375.
- gluten feed, feeding value, (42) Kans. 372; (44) Del. 367; (46) Iowa 363; (47) 278.
- gluten meal, analyses, (41) Can. 565; (42) Mass. 866; (43) Ind. 69, N.J. 69, N.J. 672; (45) N.Y.State 469, N.J. 774; (47) 275.
- gluten meal and feed, analyses, (44) Mass. 671; (47) Ind. 473.
- gluten meal, commercial, nutritive value, (42) 756.
- grading, (41) U.S.D.A. 636.
- grading for feeding purposes, (41) 409.
- green, composition at different stages, (47) 373.
- green, effect on flavor of milk, (50) U.S.D.A. 276.
- green manuring experiments, (41) Del. 136; (44) R.I. 22; (46) N.J. 514; (48) N.J. 324.
- growing, circular for club members, (48) 236.
- growing contests, (43) Ind. 395.

Corn—Continued.

growing with cowpeas, (41) Tex. 36.
growing with velvet beans, Ga. (41) 32, 39.
growth as affected by nutrients, (45) Mo. 826.
growth as affected by soaking and aeration, (41) 632.
growth data, (48) N.Dak. 30.
growth, effect of cyanamid and dicyan-diamid, (42) 428.
growth, effect of pH, (47) 435.
growth in alkali soil, (42) Utah 28.
growth in Egypt, (46) 439.
growth rate, (45) 525.
Guam, culture, (44) Hawaii 29.
Guam, origin and growth, (43) 638.
Guam, yields, (46) Hawaii 633.
handling for exports, (45) 534.
harvester, tests, (42) 185.
harvesting in Argentina, (47) 32.
harvesting machinery, studies, (45) 186.
head smut, description, (43) Wash. 242.
head smut in Washington, (50) 146.
head smut, notes, (45) 545.
heating value, (47) 888; (49) 84.
hereditary difference between types, (45) Nebr. 231.
heritable characters, (45) 523; (47) 326; (49) 632, 826; (50) 528.
high cost of production, cause, (48) 186.
high protein strain, (42) 231.
hill fertilization, (48) Mich. 334.
hogging down, (41) U.S.D.A. 72, 799; (42) U.S.D.A. 374; (43) U.S.D.A. 466, Ky. 871; (44) U.S.D.A. 772; (45) N.Dak. 474; (47) N.Dak. 670; (48) 72, N.Dak. 72; (49) La. 272; (50) N.Dak. 67.
hogging down, costs and returns, (49) Ohio 372.
hybrids, studies, (43) 529; (48) Nebr. 133.
hybrids, tests, (45) Miss. 129.
hybrids, yields, (44) Kans. 224.
improvement, (45) 228; (46) 830; (49) N.C. 733.
improvement and hybridization, (45) V.I. 127.
improvement at Manitoba, (48) 530.
improvement, effect of inbreeding and crossbreeding, (42) 231.
in different forms, feeding value, (49) Ohio 371.
in storage as silage, loss in grain, (48) 472.
in storage, insects affecting, (44) 760.
inbreeding experiments, (41) 747.
increased production, (46) Hawaii 633.
Indian, insects affecting, (47) 551.
industry in Antigua, (46) 226.
infected with *Diplodia zeae*, effect on cattle, (44) 78.
infection, studies, (48) Del. 643.

Corn—Continued.

inheritance and environment studies, (41) N.J. 42.
inheritance in, (44) 726; (49) 225.
inheritance of aleurone color, (41) 733.
inheritance of blotch leaf in, (50) N.Y.Cornell 24.
inheritance of defective seeds, (49) 826.
inheritance of dwarfing in, (50) 129.
inheritance of endosperm, (41) U.S.D.A. 437, 726, 827.
inheritance of fasciation, (42) 34.
inheritance of ramose inflorescence, (46) U.S.D.A. 229.
inheritance of scarred endosperm and size, (48) Mo. 437.
inheritance of silk color, (46) N.Y.Cornell 634.
inheritance of variations in, (44) 25, U.S.D.A. 734.
inheritance of zigzag culms, (48) 630.
insects affecting, (41) 56; (42) 53, 232, Ohio 852; (43) Ala.Col. 57, 450; (44) 57, V.I. 351; (45) V.I. 150, 656; (47) Ohio 359.
international production and trade, (44) 490.
irrigation experiments, (41) Nebr. 433; (43) Utah 230; (46) 634.
judging, (48) 97.
kernel starchiness as index of susceptibility to rot, (47) 243.
kernels, freezing point during ripening, (50) Minn. 126.
kernels, variations, effects, (41) Del. 137.
kiln dried, feeding value, (47) Md. 73.
land, plowing v. disking for small grain, (41) Nebr. 434.
laws and corn prices in England, (49) 91.
leaching effect on utilization of rock phosphate, (43) 427.
leading companion, crops, (48) S.C. 628.
leaf aphid, method of study, (46) 245.
leaf aphid, notes, (45) 152.
leaf blight susceptibility, segregation, (41) 747.
leaf folder, (46) Guam 748.
leaf miner, studies, (41) 553.
leafhopper, control in Hawaii, (42) 249.
leafhopper, notes, (48) Hawaii 355.
leafhopper, resistant varieties, (41) Hawaii 137.
leaf tyer, notes, (48) 459.
leaves, temperature, (50) 425.
legumes in drills with, (47) R.I. 736.
liming experiments, (41) Del. 136; (45) Ohio 126; (46) Md. 321; (49) Pa. 222.
linkage between brachysm and adherence in, (48) 228.

Corn—Continued.

- linkage in, (41) 436; (48) 630; (49) N.Y.Cornell 32.
- lithium in, (46) Colo. 29.
- low yields in South Africa, (47) 34.
- lyer disease, (45) 844.
- manuring experiments, (41) N.Dak. 739; (42) N.J. 827; (43) U.S.D.A. 134, Utah 218, 423, Mont. 739; (44) U.S.D.A. 127; (45) Ohio 126; (50) Minn. 120, Minn. 121.
- maturity, qualitative classification, (41) 408.
- meal, analyses, (41) 565, 868, N.Y.State 868; (42) 560, 769, Tex. 769, Mass. 866; (43) Vt. 464, N.J. 672, Ariz. 764; (44) 267, Mass. 671; (45) 872, Vt. 872; (46) Can. 167, Tex. 675; (47) Mass. 274.
- meal, analyses and digestibility, (45) 468.
- meal and other feeds, protein efficiency (49) 369.
- meal, composition and retail price, Conn.State (45) 375; (47) 570.
- meal deterioration, cause, (42) 608.
- meal, digestibility coefficients, (48) 574.
- meal flora, (46) 355.
- meal in storage, keeping qualities, (45) 259.
- meal, iodine values, (44) 434.
- meal, oil content, (44) 434.
- meal, phytin content, (47) 366.
- meal, soluble carbohydrates, (44) 434.
- meal, unbolted, analyses, (45) Tex. 68.
- meal v. peanut meal for milk production, (50) Can. 375.
- mealy endosperm, inheritance, (49) 632.
- Mendelian characters, (44) 428.
- mosaic, studies, (44) 49; (46) 344.
- new and old, nutritive value, (46) 167.
- new form, with multiple caryopses, (45) 32.
- new strains, (47) N.Y.Cornell 334.
- nickel and cobalt in, (49) 520.
- nitrogenous fertilizers for, comparison, (43) N.C. 427.
- number of plants per hill, (47) Ohio 133.
- nutritive deficiencies for chicks, (46) 171.
- nutritive requirements, (41) 820.
- nutritive value, (42) 457.
- oil as substitute for ghee, (43) 563.
- oil, comparison, (47) 10.
- oil, digestibility, (45) 62.
- oil, digestion by children, (42) 61.
- oil, effect of mold on, (42) 411.
- oil extracting, methods, (47) U.S.D.A. 11.
- oil, hydrogenation, (47) 502.
- oil industry, future of, (44) U.S.D.A. 206.
- oil, losses in refining, (49) 311.

Corn—Continued.

- oil, phytosterols in, (50) N.Y.State 408.
- oil, preparation and uses, (48) 310.
- oil, production, (46) 636.
- oil, production and use, (44) U.S.D.A. 205.
- oil, rancidity in, factors affecting, (48) 414.
- oil refining, (47) U.S.D.A. 10.
- on alfalfa sod, fertilizer experiments, (46) N.J. 530.
- origin of, (41) 437, 530, 727.
- original Iowa, (46) 532.
- pellucid spots, (44) Conn.State 150.
- period of greatest nitrate utilization, (43) Ill. 215.
- Philippine, mildew, life history notes, (47) 244.
- Phyllachora disease in Porto Rico, (41) 843.
- physiological characteristics, (48) Nebr. 131.
- physiological stability, (50) 628.
- pistillate spikelet and flower, cytology of, (42) 432.
- plant color types, genetic relations, (45) N.Y.Cornell 533.
- plant, pentosans in, (49) 201.
- plant structure, treatise, (49) 528.
- plant, uses, (48) 417.
- planting and harvest dates, temperature influence on, (41) U.S.D.A. 716.
- planting dates, (41) N.Dak. 809; (46) R.I. 228.
- planting dates, relation to earworm, (43) 358.
- planting rates and spacing, (42) 632.
- plants, composition as affected by disease, (43) Ind. 345.
- plants, vigor and yield, relation to disease-free seed, (49) 243.
- plastids and mitochondria in, (44) 221.
- plowing tests, (42) 283; (44) 509; (45) N.Dak. 226.
- pollen, analysis and composition, (47) 12; (49) N.Y.State 12, N.Y.State 309.
- pollen, composition, (49) 201.
- pollen mixtures, selective fertilization in, (45) 524.
- pollination, self and open, (49) 330.
- pollinator, construction and use, (42) 726.
- position in American agriculture, (49) U.S.D.A. 389.
- potash fertilizer for, (42) 125.
- prehistoric and later use, (46) 466.
- preparation for dairy cows, (45) Iowa 777.
- prices and corn laws in England, (49) 91.
- prices, relation to butter prices, (44) 872.

Corn-- Continued.

- primordia of protein plastids, (47) 223.
- processing, (49) 115.
- production and consumption, world, (42) 439.
- production and movement, 1850-1860, (44) 387.
- production as affected by prices, (44) 690.
- production, effect of enzym activity, (45) Del. 626.
- production, enzymatic activity in, (48) 624.
- production in France, (45) 737.
- production in Kansas, (42) 232.
- production in West Indies, (45) 33.
- production in Yugoslavia, (48) U.S.D.A. 529.
- production, labor expense, (45) 85.
- production, labor requirement, (49) 189.
- production of starch from, (48) Hawaii 368.
- productivity, effect of spacing, (49) U.S.D.A. 431.
- products, deficiency aspect, (41) 874; (42) 256.
- products, phosphoric acid in, relation to vitamin, (42) 256.
- project, half-acre, (49) 96.
- project study outlines, (44) 596.
- propagation, (47) R.I. 736.
- protein and ash for growing animals, (41) 367.
- protein, nutritive efficiency, (42) 459.
- proteins in, (45) 340; (48) 501.
- proteins in, variations, (47) 826.
- proteins, nutritive value, (50) 267.
- purchasing power, (49) Nebr. 292.
- purple sheath spot, (44) 542; (46) 743.
- regional adaptation, (45) Nebr. 230.
- relation of ear characters to yield, (42) 34.
- relation of potassium to growth, (43) N.H. 29.
- response to cultural methods, (45) Mont. 534.
- Rhizopus infection in germinator, (46) 846.
- root and stalk rot, (46) N.J. 547.
- root aphid, studies, (44) 451; (46) S.C. 747.
- root disease, notes, (43) 243.
- root rot, acidity-infection curve, (46) Mo. 344.
- root rot, bacterial, (41) Ark. 747.
- root rot, immune varieties, (47) Ill. 837.
- root rot, notes, (44) Kans. 242; (46) Del. 239, Kans. 448, 543.
- root rot, prevention, (49) Ohio 346.
- root rot, relation to seed infection, (43) Ky. 653.
- root rot resistance, (48) Ky. 145.

Corn--Continued.

- root rot, studies, (44) 541; (45) Mo. 244, Wis. 244, 542; (46) Iowa 342, Ky. 846; (47) 243, 244; (49) Miss. 441, Ind. 538.
- root rot susceptibility, relation to endosperm, (47) U.S.D.A. 447.
- root rots, control, (43) Ind. 34.
- root rots, relation to absorption of salts, (49) 327.
- root tips, excised, cultivation under sterile conditions, (49) 627.
- root webworm, summary, (47) U.S.D.A. 458.
- roots, growth in sterile media, Mo. (46) 323; (48) 643.
- rootworm on rice, (43) U.S.D.A. 253.
- rot diseases, control, (44) U.S.D.A. 244.
- rotation experiments, (41) N.Y.Cornell 21, Kans. 32, Del. 136, Ohio 136, N.Dak. 139, N.Dak. 823, N.Dak. 824; (42) 230, U.S.D.A. 336, Minn. 731; (43) Ohio 726; (44) Kans. 213, Del. 431, N.Dak. 524, Utah 525, Oreg. 827; (45) Ohio 119, Ohio 126, Mo. 215, N.Dak. 216, Mont. 339, 340, R.I. 529, Del. 622, N.Dak. 734; (46) 819; (47) Minn. 130, Miss. 216, La. 428; (48) Minn. 321, Minn. 332; (49) Nebr. 328, Oreg. 526, Ohio 725; (50) N.Y.State 422, R.I. 520.
- rotation experiments with and without manure, (48) Calif. 526.
- rots, control, (44) Ill. 36.
- rots, control methods, (47) 243, 244.
- rust, false, notes, (43) Okla. 44.
- rust, studies, (47) 44, 244; (50) 747.
- rust, varietal susceptibility, (45) 747.
- sand drown, cause, (48) 49.
- scab organism, production of conidia, (43) 545.
- Sclerosporas, production and dispersal of conidia in, (49) 46.
- seed--
 - acclimated v. imported, (45) Nebr. 231.
 - as affected by heat, (41) 430.
 - as affected by organic substances in soil, (41) 523.
 - broken and entire, yields, (44) 634.
 - condition, effect on crop, (49) Ill. 343.
 - curing, (47) Iowa 734.
 - diastatic activity, (50) 222.
 - discoloration, relation to disease, (46) Iowa 342.
 - for Washington, (41) Wash. 232.
 - formaldehyde treatment, (42) 542.
 - freezing injury, (43) Nebr. 827.
 - from smooth and rough ears, (41) Del. 137.
 - fungi internal to, (49) 243, 542.

Corn—Continued.

seed—continued.

- harvesting at different stages, (41) N.Dak. 139.
- home-grown, value, (46) N.J. 530; (49) Mont. 136.
- hybrid v. pure, (41) Del. 137.
- immersion in nutritive solutions, (47) 39.
- improvement, (44) U.S.D.A. 230; (47) N.C. 528.
- improvement, suggestions to teachers, (44) U.S.D.A. 698.
- infection, (43) Ky. 653; (48) 46, 145, Mo. 644.
- internal fungi, (46) 547.
- parasite, (44) 343.
- production, (30) U.S.D.A. 132.
- production. improvement, (49) Nebr. 225.
- selection, (41) N.J. 35, 436; (44) Ill. 36, P.R. 36; (46) 832; (48) Nebr. 131; (49) Ohio 733.
- selection and preservation, (44) Mich. 138.
- soaking and puncturing, (41) 632.
- testing, rag-doll method, (42) N.Y. State 341.
- testing, rag-doll, modified, (43) Ind. 135.
- tests, (45) 634.
- treatment for downy mildew, (49) 750.
- types, (47) 115.
- yellow, vitamin A content, (46) 357.
- seeding experiments, (41) Tex. 36, N.J. 42; (44) R.I. 32; (45) La. 223; (46) Tenn. 133, N.H. 328, Tex. 328, Guam 726; (47) Ark. 733; (48) N.Mex. 133; (49) Ga. 524, Nebr. 733.
- seedling blight, factors affecting, (49) 345.
- seedling blight, relation to soil temperature, (47) 246; (50) 548.
- seedlings, carbohydrates, effect of desiccation methods, (49) 10.
- seedlings, effect of pH, (48) Del. 26.
- seedlings, growth as affected by H-ion concentration, (43) 525.
- seedlings, temperature relations, (49) Wis. 644.
- seeds, manganese content, (49) 731.
- seeds, mutilated, effects, (46) U.S.D.A. 827.
- selection and breeding, (46) Del. 628.
- selection, continuous, (49) Ill. 329.
- selection of pseudo-starchy endosperm in, (41) 827.
- selective fertilization, (47) 28.
- self-pollinating, new method, (50) 333.
- shelled, analyses, (43) Ky. 373.
- shelled, and clover hay, feeding value, (47) Minn. 374.
- shelled, feeding value, (48) S.C. 69.
- shelled, respiration, (46) Minn. 828.

Corn—Continued.

- shelled v. broken ear, feeding value, (48) Ky. 169.
- sheller, power-distribution tests, (42) 893.
- silage, *see* Silage.
- smut, control, (44) Mich. 828, Oreg. 841; (45) 50, 845; (46) 648; (49) Okla. 542.
- smut epidemic following hail, (41) 154.
- smut, head and common, differentiation, (43) Wash. 243.
- smut in Ohio, description, (42) Ohio 448.
- smut, new, in Washington, (45) 541.
- smut, notes, (41) Kans. 48; (43) 152; (44) 48, Kans. 242; (45) 842; (46) Kans. 448; (47) 244; (50) Minn. 143.
- smut resistance, (44) Minn. 745.
- smut resistant varieties, breeding, (50) Minn. 144.
- smut susceptibility, segregation, (41) 747.
- soft, composition and nitrogen distribution in, (41) 408.
- soft ear, preserving, (50) Iowa 64.
- soft, in Iowa, cause, (50) 435.
- soft, reduction of moisture, (44) 527.
- soft, salt treatment, (42) Wis. 337.
- soy beans planted with, tests, (46) Iowa 326.
- spacing experiments, (47) U.S.D.A. 430.
- standards for, (41) U.S.D.A. 636.
- starch, determination, (44) 434.
- starch, microphotograph of, (48) 708.
- statistics, (41) 826; (42) U.S.D.A. 731.
- sterilization, (46) 754.
- Stewart's disease of, (45) 352.
- stomata structure, factors affecting, (46) 322.
- stored, Botrytis cinerea affecting, (49) 842.
- stover, analyses, (45) 775.
- stover, effect of drainage, (42) Wis. 384.
- stover, fertilizer experiments, (48) Minn. 322.
- stover, fertilizing value, Minn. (48) 322; (50) 121.
- stover silage v. corn silage for milk production, (45) 174.
- stover, use as fertilizer, (47) Minn. 124.
- strontium in, (46) Colo. 29.
- structure and function, correlation, (46) Mo. 331.
- substitutes for lambs, (49) Iowa 571.
- suckering, (41) N.J. 42.
- sugar cane borer attacking, (44) 353.
- supplements for fattening pigs, (43) 377; (45) Ohio 674; (47) Pa. 474.
- supplements for pigs, (44) Del. 367; (46) U.S.D.A. 767.

Corn—Continued.

- supplements, protein, comparison, (45) Ohio 676.
 sweet, *see* Sweet corn.
 sweet clover as green manure for, (49) Ill. 315.
 textbook, (43) 638.
 tillage experiments, (45) 225, Mo. 633.
 time for applying sodium nitrate to, (43) Ala.Col. 333.
 time of germination and maturity, (42) Va. 436.
 time of planting test, (44) Mont. 331.
 trade, British, treatise, (45) 192.
 transplanting, (49) 826.
 treatment for bollworm, (45) Mo. 252.
 types, relative susceptibility to *Aplanobacter stewarti*, (47) 245.
 uses as food, (49) U.S.D.A. 158.
 utilization by fowls, (46) 173.
 v. barley, feeding value, (46) 271; (47) Mich. 175.
 v. barley for fattening pigs, (43) Mo. 772.
 v. barley for fattening steers, (45) Wis. 268.
 v. barley for milch cows, (44) Wis. 271.
 v. cane seed, feeding value, (50) Kans. 67.
 v. grain sorghum, feeding value, Tex., (45) 69; (47) 473; (48) 169; (50) 66.
 v. hominy feed for fattening pigs, (43) Mo. 772.
 v. oats, feeding value, (49) 69.
 v. sorghum for fattening lambs, (45) 471.
 v. sorghum silage as feed for steers, (42) Kans. 371.
 v. sorghum, yields, (48) Mo. 628.
 varietal crosses, yields, (45) 633.
 varieties, (43) N.C. 434; (44) Kans. 225, P.R. 442; (45) Wis. 228; (46) Mich. 633; (47) Kans. 132, 133, Ark. 733; (48) N.Mex. 133; (49) Wis. 629; (50) S.Dak. 638, Miss. 828.
 varieties, alteration of names, (48) 438.
 varieties, characteristics and yields, (47) Minn. 331.
 varieties, culture, (49) Miss. 222.
 varieties, first generation crosses, (42) Minn. 338.
 varieties for chinch bug infested areas, (49) Ill. 330.
 varieties for forage, (41) Ariz. 332; (44) Wis. 226.
 varieties for late planting, (41) Ala. Col. 335.
 varieties for silage, (41) N.Dak. 139, Nev. 227; (42) U.S.D.A. 337; (44) U.S.D.A. 136; (48) Can. 31, Can. 227; (49) N.H. 328; (50) Can. 533.
 varieties for silage, milk-producing value, (48) 77; (50) 474.

Corn—Continued.

- varieties for various sections, (47) Pa. 429.
 varieties, good, (49) Mich. 97.
 varieties, improvement, (45) Mo. 129.
 varieties in Argentina, (42) 530.
 varieties, late v. early maturing, (47) U.S.D.A. 430.
 varieties of Michigan, Mich., (44) 138, 828.
 varieties, yields, (49) Va. 134.
 varieties, yields and prolificness, (46) Miss. 729.
 variety and ear-to-row tests, methods, (41) 436.
 variety, early in Canada, (46) 138.
 variety tests, (41) Ga. 31, Tex. 35, Del. 137, Hawaii 138, Idaho 225, 530, Mo. 637, N.C. 638, N.Dak. 824, 825; (42) 132, 436, Va. 436, Mich. 631, 633, Minn. 731, N.Dak. 732; (43) Tex. 33, Md. 133, U.S.D.A. 134, Tex. 230, U.S.D.A. 435, La. 636, Can. 735, Minn. 823; (44) Hawaii 29, N.Dak. 30, R.I. 31, R.I. 32, Alaska 330, V.I. 332, Mont. 336, Ariz. 524, N.Dak. 524, S.C. 525, Utah 525, 526, 527, U.S.D.A. 732, Va. 732, Oreg. 827; (45) 34, Miss. 37, Ohio 126, Miss. 128, Miss. 129, La. 223, Miss. 223, Mo. 224, N.Dak. 225, Md. 228, 340, S.C. 341, Okla. 430, Tex. 432, U.S.D.A. 530, Nebr. 531, 734, Can. 822; (46) 131, Mont. 327, N.H. 328, Kans. 435, 634, S.C. 725, Guam 726; (47) Mich. 129, Minn. 130, Miss. 227, Minn. 332, Minn. 333, Ga. 427, La. 428, Miss. 428, Tenn. 632, R.I. 736, Okla. 823, Miss. 831; (48) N.Dak. 30, Can. 31, Ga.Coastal Plain 128, P.R. 227, Minn. 331, Minn. 332, 434, Ariz. 434, Calif. 527, Ga.Coastal Plain 628, 629, S.C. 629; (49) Miss. 32, Mont. 129, Miss. 222, Wash.Col. 224, 329, Kans. 427, Miss. 428, Tex. 429, Ky. 525, U.S.D.A. 630, Idaho 732, Iowa 732, Ohio 733; (50) U.S.D.A. 132, Mont. 133, Can. 432, S.C. 637, 828.
 viability, effect of loss of water, (48) N.J. 353.
 vitamin A in, (46) 357.
 vitamins in at different stages, (50) 769.
 water requirements, (45) Nebr. 531; (50) 828.
 waxy, from upper Burma, (44) 230.
 weevil, life history, (43) 762.
 weevil, notes, (43) N.C. 450.
 white, vitamin A deficiency, (47) Wis. 468.
 wild, a weed in Indiana, (50) 641.
 wireworms, notes, (43) Conn.State 252.
 xenia in, (41) 726.
 yellow, fat-soluble vitamin in, (42) 257, 556.

Corn—Continued.

- yellow v. white, feeding value, (42) 461; (47) Wis. 467; (48) 398; (49) 265.
- yellow v. white for growing chicks, (47) Nebr. 781.
- yellow v. white for pigs, (49) Wis. 672, Nebr. 775.
- yellow, vitamin A extraction from, (43) 367.
- yield and market conditions as affected by fertilizers, (47) 530.
- yield cycles, (41) 892.
- yield determinations, error in, (48) 196.
- yield, effect of continuous cropping, (47) Va. 625.
- yield in Corn Belt as affected by weather, (44) U.S.D.A. 118.
- yield, relation to weather in Argentina, (46) U.S.D.A. 619.
- yields, (41) N.J. 35, Ariz. 332; (44) U.S.D.A. 228; (45) Miss. 223, Mo. 224, N.Dak. 225; (46) Mo. 326; (49) La. 824.
- yields, comparative, competition as source of error in, (50) 233.
- yields from experiment fields, (45) Ill. 727.
- yields in Egypt, limiting factors, (44) 829.
- yields in New Jersey, (46) 225.
- yields, increasing, (48) N.C. 528.
- yields, relation to length of kernel, (45) 533.
- yields with different systems of farming, S.Dak. (44) 626; (49) 528.
- zebra striped leaves, inheritance, (49) 632.

Corncob—

- and husk, ground, analyses, (46) Tex. 675.
- cellulose, use in explosive industry, (45) 616.
- ground, analyses, (45) Tex. 68.
- meal, effect of hydrolysis, (45) 773.
- rot, notes, (45) 842; (47) 44.
- sirup, fermentation, (46) 208.

Corncobs—

- acetone production from, (46) 208.
- alcohol production from, (46) 208.
- furfural manufacture from, (46) 710; (49) 507; (50) 505, 806.
- ground, analyses, (42) Tex. 769.
- ground, feeding value, (42) Tex. 369.
- production of acetic and lactic acid from, (45) 510.
- treated, nutritional value, (48) 568.
- utilization, (43) 809.
- volatile acids production from, (46) 208.
- xylose from, (41) 117.

Cornell—

- University and State Station, affiliation, (42) 498.
- University, notes, (41) 100, 499; (42) 93, 696, 900; (43) 100, 299, 799,

Cornell—Continued.

- University, notes—Continued.
- 900; (44) 396, 797; (45) 97, 199, 699; (46) 197, 299, 700; (47) 99, 399; (49) 299, 698, 900.

Cornfield weeds, control, (47) 235.

Cornstalk borer—

- in Africa, (45) 554.
- larger, in North Carolina, (45) 58.
- larger, studies, (46) Va. 155.
- lesser, on beans, (43) Ariz. 733.
- notes, (41) Conn.State 159; (43) 358, N.C. 450.

Cornstalk—

- boring noctuid, paper on, (50) 846.
- rot, cause, (44) 541.
- rot, relation to seed infection, (43) Ky. 653.

Cornstalks—

- carbohydrates, effect of desiccation methods, (49) 10.
- diseased, iron in, (44) 541.
- feeding value, (42) 769.

Cornstarch—

- action of enzymes on, (41) 409.
- fatty material in, (44) 111.
- raw, digestibility, (43) 365.

Corpus luteum—

- appearance in ovaries of cattle and swine, (46) 266.
- as affecting ovulation, (41) 175.
- effect of uterus extirpation, (50) 826.
- function, (48) 869.
- of spermophile, studies, (42) 667.
- origin in swine, (42) 668.
- relation to sexual cycle, (50) 635.

Corpuscles and plasma, analyses, (47) 205.

Corral gate, plans, (42) Mont. 86.

Correlation—

- and probable error, formulas for calculating, (48) 265.
- average, within subgroups of a population, (41) 366.
- between a variable and dependent variable, coefficient, (41) 366.
- between two structures or organs of the body, calculation, (41) 473.
- coefficient in plant breeding, demonstrating, (41) 697.
- coefficients, standard deviations of fraternal and parental, (48) 762.
- data, interpretation, (50) Tex. 729.
- heredity and regression, (48) 868.
- physiological, problems, (47) 126.

Correlations, mathematical basis for calculating, (49) 175.

Corrosive sublimate—

- and formaldehyde, comparison, (46) Iowa 342.
- as disinfectant for blight control, (44) Oreg. 848.
- as milk preservative, (42) 173.
- for barley treatment, (49) 840.
- for bean seed treatment, (49) 841.
- for cabbage, (50) Pa. 454.
- for cabbage blackleg, (43) 46.
- for cabbage maggot, (45) 557; (49) 557.

Corrosive sublimate—Continued.

- for potato seed treatment, (47) Mich. 129, Mich. 149, Minn. 332, Minn. 352; (48) 245; (49) 47, Idaho 746.
- for subsoil nematodes, (43) 47.

Corticium—

- evolvens, relation to growth in fir, (45) 357.

- javanicum, notes, (49) 540; (50) 42.
- koleroga, notes, (45) 48.
- lilacofusum, notes, (45) 653.
- salmonicolor, control, (42) 646; (45) 752.

- salmonicolor, distribution, (46) 652.
- salmonicolor, notes, (46) 44; (48) 45.
- salmonicolor on rubber, (45) 148.
- solani, notes, (44) 447.
- sp., notes, (45) 842.

- vagum, notes, (43) 246; (45) U.S.D.A. 357, 842; (46) 147, 450; (47) S.Dak. 448; (48) 348.

- vagum, pathogenicity, effect of soil temperature, (45) 543; (47) 352; (49) 347; (50) 348.

- vagum solani, notes, (41) 451; (43) 151; (46) 847; (49) 843; (50) 550.

Cortinarium on conifers, (48) 725.

Corvus brachyrhynchos, damage done by, (42) Okla. 355.

Corydalis cornuta, process of hatching, (45) 254.

Corymbites cupreus, notes, (48) 460.

Corynebacterium equi, proposed name, (50) 685.

Coryneum—

- cocoas, notes, (47) 547.
- follicolum, notes, (46) 242.
- perniciosum, notes, (43) 448.
- rhododendri, description, (45) 547.
- spp., notes, (48) 850.

Corypha laevis, fiber from, (42) 531.

Corythaica stål, notes, (41) 551.

Corythucha—

- bellula, studies, (42) 749.
- gossypii, notes. V.I. (45) 150; (49) 352.
- pallipes, life history, (50) 453.

Cosmetics and perfumes, treatise, (50) 308.

Cosmopolites sordidus, *see* Banana root borer.

Cosmopterygidae, new, descriptions, (42) 157.

Cosmopteryx—

- clemensella, notes, (42) 157.
- n.sp., notes, (43) 52.
- opulenta n.sp., notes, (42) 157.

Cost determination, problem of interest and rent in, (49) 487.

Cost of living—

- and rural cooperation in Belgium, (49) 895.
- food budgets in, (44) 260.
- in Philadelphia, (44) 859.
- increased, effect on family budget, (44) 169.

Cost of living—Continued.

- of rural workers in Great Britain, (41) 193.
- on farm, (48) Mo. 686.
- studies, (42) 253, 364.

Cost of production, (46) 590, Miss. 590. N.J. 590; (48) N.Dak. 293; (49) N.Y.Cornell 691, Can. 734.

Cost of production—

- and farm organization, N.Dak. (48) 490, 491.
- effect of variations in prices, (47) 794.
- methods of study, (46) U.S.D.A. 291.
- of crops and milk in France, (50) 191.
- of crops and milk in Scotland, (50) 191.
- studies in Kansas, (42) 290.

Cotthonaspis gilletei, notes, (50) Pa. 454.

Cotinis nitida, *see* June beetle, green.

Cottage building in England, costs, (49) 639.

Cottages in England, construction, (45) 83.

Cotton—

- action of light on, (50) 436.
- airplane dusting, (50) U.S.D.A. 658.
- airplane fabric, tests, (44) U.S.D.A. 138.

alcohol from, (47) 207.

American, classification, (50) U.S.D.A. 639.

American Egyptian, value of, (43) Ariz. 137.

American, increased value, (42) 232.

and flax fibers, studies, (50) 134.

angular leaf spot, control, (43) Okla. 44, 243, 652; (44) S.C. 542; (46) S.C. 741; (47) Ark. 732; (48) Ariz. 449; (50) 549.

anthracnose in seed, (44) S.C. 542.

anthracnose, notes, (42) S.C. 447; (43) 243, 244; (46) S.C. 741; (47) 348; (50) 349.

aphid, life history studies, (43) Tex. 758.

aphid, notes, (42) Ariz. 357; (43) U.S.D.A. 352; (45) V.I. 150; (49) V.I. 352.

Arizona wild, distribution, (49) Ariz. 558.

army worm on, (43) 557.

as affected by borax, (44) 516; (49) 217, U.S.D.A. 325.

as affected by cyanamid, (50) U.S.D.A. 622.

as affected by phos-pho-germ. (45) 817.

as affected by sulphur, (49) 33.

as affected by weather, (44) U.S.D.A. 119.

as honey plant, (46) 160.

asal and causes in the Sudan, (47) 849.

Ascochyta disease, new, (47) Ark. 447.

bacterial spot, (46) 544.

Belt, agricultural conditions in, (47) 296.

Belt, climate of, (42) U.S.D.A. 14.

Cotton—Continued.

- Belt, farm life and land tenure, (46) 189.
- black arm, control, Ariz. (48) 449, 452.
- boll cast, climatic, (45) 842.
- boll cutworms, control, (49) V.I. 352.
- boll disease, notes, (42) 147.
- boll rot, notes, (43) 243; (46) 847.
- boll shedding, cause, (49) N.C. 747.
- boll shedding, factors affecting, (44) 134.
- boll weevil—
 - control, (41) 463, 667; (42) U.S. D.A. 786; (45) Ala.Col. 55, Tex. 458, 662; (48) Fla. 254, 556. S.C. 652; (49) U.S.D.A. 558, U.S.D.A. 659; (50) 57, U.S.D.A. 259, U.S.D.A. 658, S.C. 663.
 - control, discussions, (50) 399.
 - control in Arkansas, (50) 663.
 - control methods, (49) 255.
 - damage to, (47) U.S.D.A. 797.
 - dispersion, (46) U.S.D.A. 751.
 - dispersion in 1920, (44) U.S.D.A. 658.
 - dispersion in 1922, (49) U.S.D.A. 156.
 - in Arizona, (44) 659; (45) 859.
 - in Virginia, (48) 856.
 - life history, (44) S.C. 554; (48) Okla. 359.
 - Mexican, biology of, (45) U.S.D.A. 59.
 - Mexican, quarantine work, (48) 852.
 - native, (44) Ariz. 548.
 - notes, (41) 755; (42) 153. Ariz. 357; (43) N.C. 450; (48) U.S. D.A. 52; (49) N.C. 757, 758.
 - on Thurberia, (47) 53; (48) 852.
 - Philippine, notes, (49) 156.
 - poisoning, (43) Ala.Col. 57, 456, 561, 562, U.S.D.A. 856; (44) U.S.D.A. 659; (45) Ala.Col. 60, U.S.D.A. 762; (47) U.S.D.A. 163, Miss. 659.
 - poisoning as affected by dew and rain, (43) 162.
 - poisoning, progress, (50) Miss. 760.
 - poisoning, relation to moisture, (48) 653.
 - problem, (50) Ark. 850.
 - quarantine, (44) 249.
 - studies, (46) S.C. 747.
 - summary, (46) 558; (49) Okla. 558.
 - wild, distribution, (49) Ariz. 558.
- bollworm—
 - attraction to corn plant, (48) 651.
 - control, (46) Va.Truck 336; (49) V.I. 352.
 - control in India, (43) 51.
 - corn as trap crop for, (43) 852.

Cotton—Continued.

- bollworm—continued.
 - effect on yield, (44) 655.
 - notes, (42) Ariz. 357; (43) U.S.D.A. 352; (45) V.I. 150; (47) Conn.State 156, 254, 357; (48) U.S.D.A. 52; (49) 758; (50) 533.
- bollworm, pink—
 - and false, distinguishing characters, (48) 56.
 - and its enemies, (41) 455.
 - combating, (45) 554.
 - control, (41) 256; (47) 361; (48) V.I. 332; (49) V.I. 352.
 - developments in relation to, (48) 852.
 - differentiation, (41) 552; (45) 156.
 - disinfecting seed for, (50) 53.
 - distribution in Porto Rico, (48) 56; (50) 357.
 - economic harm from, (46) 658.
 - effect on seed and lint, (43) 160; (45) 554.
 - eradication, (43) 161.
 - in Belgian Kongo, (49) 759.
 - in Brazil, parasites of, (44) 356.
 - in Egypt, (42) 547; (45) 657; (47) 256; (48) 750.
 - in India, (43) 450.
 - in Lower California, (42) 153.
 - in Mexico, (45) U.S.D.A. 155.
 - in Porto Rico, (49) 550.
 - in South India, (49) 556.
 - in Virgin Islands, (45) 661.
 - in West Indies, (45) 457; (46) 56.
 - life history and control, (43) 160; (44) 254.
 - notes, (42) Ariz. 357, 360, 548; (43) Ala.Col. 57, 554; (44) 249, 656; (48) U.S.D.A. 52, 852; (49) 758.
 - of Thurberia, (50) 660.
 - on okra, (45) 759.
 - origin, (44) 353.
 - review of literature, (49) 254.
 - scouting for, (44) 753.
 - situation in California, (50) 357.
 - studies, (48) Ariz. 457.
 - summary, (43) 454; (46) 558.
- bollworm, Thurberia, notes, (48) 852.
- bollworms in India, (45) 657; (47) 256.
- bolly, spinning tests, (47) 34.
- botanical research in Egypt, summary, (46) 230; (49) 131.
- Brazilian, (47) 633.
- breadth of fiber and strength, (47) N.C. 528.
- breeding—
 - and depression of lint length, (50) 28.
 - and selection, (47) La. 428.

Cotton—Continued.

breeding—continued.

- experiments, (41) 825; (42) Ala. Col. 821; (43) Okla. 32, U.S.D.A. 329, N.C. 434; (44) 137, 527, 827; (45) 33, N.C. 430, Okla. 431, 734; (46) 226, S.C. 725; (47) Miss. 227, Okla. 824; (48) 434, 629, S.C. 629; (49) Miss. 225, Miss. 428, Tex. 429, 535; (50) S.C. 637.
- in Egypt, (44) 500.
- bud and boll shedding, (49) 842.
- bug, brown, notes, (42) Ariz. 357.
- bug, dusky, notes, (47) 357.
- Bundelkhand, improvement, (46) 833.
- burs, feeding value, (42) Tex. 369.
- cake, feeding value, (46) 678.
- cellulose and wood cellulose, comparison, (47) 809.
- cellulose hydrolysis, (47) Calif. 625.
- cellulose, standard, preparation and analyses, (50) 206.
- classing, (43) N.C. 490.
- climatic requirements, (41) U.S.D.A. 417.
- club leaf or cyrtosis, (43) 446.
- Committee, Indian Central, activities, (50) 830.
- communities, one-variety, (48) U.S. D.A. 530.
- compression into plugs, (50) 436.
- Conference, World, report, (46) 729.
- correlations of characters, (43) Ark. 530.
- cost of production, (44) U.S.D.A. 384; (45) 293; (46) 590.
- countries of world, statistics, (49) 32, 529.
- crop, computing, (45) U.S.D.A. 722.
- cross-fertilization and sterility in, (45) 634.
- culture, (43) Ariz. 137; (47) 228, Miss. 428; (48) V.I. 332; (50) Tenn. 31.
- culture—
 - along the Nile, (46) 495.
 - and irrigation on Niger, (49) 82.
 - climates suitable for in British Empire, (43) 621.
 - experiments, (41) Ga. 31, Ark. 140, 528, Mo. 637, 639, 729, 825; (42) 132, Miss. 232, 436, N.Mex. 829; (43) Tex. 33, U.S.D.A. 134, U.S.D.A. 329, Ariz. 733; (44) 433, 527, 632, 633, 733, 827; (45) Guam 34, Miss. 129, Miss. 130, 340, 532; (46) 227, 436, 437, 634; (47) U.S.D.A. 430; (48) Va. 333, Ariz. 434, 629; (49) Miss. 225, Miss. 428, Tex. 429; (50) 28, 828.
 - experiments in Mesopotamia, (44) 435.
 - extension in Tanganyika, (48) 229.

Cotton—Continued.

culture—continued.

- in Argentina, (46) 635.
- in Asiatic Turkey, (43) 531.
- in Australia, (42) 233.
- in Belgian Kongo, (43) 828.
- in Bombay, early history, (41) 531.
- in Brazil, (46) 229.
- in British Empire, possibilities, (42) 233.
- in Burma, (41) 529; (42) 436.
- in California, (44) U.S.D.A. 734.
- in Ceylon, (41) 529.
- in China, (44) 230.
- in Egypt, extension of, (42) 438.
- in French colonies, (41) 828; (46) 532.
- in Guam, (42) Guam 31.
- in Ilorin Province, (49) 734.
- in India, (41) 522, 529, 531, 640, 828; (47) 826.
- in Indo-China, (44) 635.
- in Kentucky, (50) 830.
- in North Africa, (41) 734.
- in Peru, (42) 34.
- in Philippines, (45) 738.
- in Rhodesia, (41) 734.
- in Uganda, (42) 32.
- in various countries, (49) 331.
- in West Africa, (43) 828.
- on sand hill land, (41) 813.
- on Yuma project, (43) U.S.D.A. 393.
- single-stalk, (42) 136.
- to combat pink bollworm, (42) 547, 548.
- cutworm, notes, (44) Kans. 249.
- damage, causes and extent, (41) U.S.D.A. 696.
- damage from various causes, (44) U.S.D.A. 118.
- delayed harvesting, (41) Ark. 37.
- delint for paper making, (41) 734.
- demonstrations, results, (49) La. 890.
- desirable staple in, (50) 535.
- deterioration of seed production, (47) Ark. 732.
- Diplodia boll rot, notes, (50) S.C. 648.
- disease, new, (46) S.C. 741.
- disease, new Phoma, (47) 350.
- disease, notes, (44) 342.
- disease survey in India, (46) 544.
- diseases, control, (43) 544; (45) U.S.D.A. 246.
- diseases, descriptions, (45) Ark. 353.
- diseases in Sao Paulo, (45) 649.
- diseases, notes, (41) Ariz. 345; (46) 845; (48) 45.
- duck, mildewproofing and waterproofing, (44) U.S.D.A. 139.
- duck, waterproofing, (46) 187.
- dusting experiments, (46) 58; (47) Ga. 427; (49) Ga. 524; (50) 458.
- dusting machinery, (49) U.S.D.A. 590; (50) 57.

Cotton—Continued.

- effect of phosphatic fertilizers, (49) 726.
- effect on England's neutrality during Civil War, (42) 894.
- Egyptian—
 - breeding experiments, (44) 230.
 - culture in Arizona, (48) 833.
 - decline in yield and causes, (47) 826.
 - deterioration of and its remedy, (41) 531.
 - improvement, (42) 232; (44) 434.
 - soil nitrification under, (41) 812.
- equilibrium moisture, (50) 535.
- examination of characters in, methods, (49) 228.
- Exchange, Bremen, history and operation, (48) 789.
- experiment stations, Chinese, (46) 133.
- experiments, (48) Miss. 732; (49) 131; (50) Miss. 735.
- experiments in Africa, (46) 227.
- fertilizer experiments, (41) Ga. 31, Ark. 130, Ala.Col. 335, 528, 529, 813, 814, 825; (42) Va. 21, 132, 436, Ala.Col. 822, N.Mex. 829; (43) Okla. 32, S.C. 126, Ala.Col. 135, Ga. 136, Ga. 137, Tex. 230, Ala.Col. 233, N.C. 424, N.C. 427, Mo. 736; (44) 230, 632, Ala.Col. 722, 733, 827; (45) Ga. 37, Ala.Col. 119, Miss. 126, Miss. 130, Miss. 223, Mo. 224, N.C. 430, 532; (46) 227, 437, 634, S.C. 717; (47) S.C. 23, Miss. 217, Ga. 427, Miss. 428, Ark. 519, N.C. 528, Ark. 725, Miss. 734, S.C. 736; (48) Va. 333, Ariz. 434, Mo. 628, 629, Ala. 832; (49) Miss. 222, Miss. 225, Miss. 330, Miss. 428, Okla. 428, Ga. 524; (50) 28, U.S. D.A. 132, S.C. 621, S.C. 637, Miss. 828.
- fertilizer experiments in India, (42) 517.
- fertilizer quantity effect on profit, (43) N.C. 425.
- fertilizer requirements, (42) Tex. 530.
- fertilizers, before v. after planting, (42) 438.
- fibers, measurements, (50) 234.
- fibers, technological qualities and classing, (46) 635.
- fineness in, estimating, (50) 736.
- fire protection, (41) U.S.D.A. 692.
- five-lock bolls in, (46) 833.
- foliage, resistance to sprays, (45) Ga. 38.
- from Tanganyika, examination, (48) 335.
- Futures Act, regulations under, U.S.D.A. (41) 492; (48) 93.
- germination, effect of fertilizers, (49) 122.

Cotton—Continued.

- germination, effect of organic substances, (41) 523.
- germination, fertilizer injury to, (50) N.J. 216.
- gin damage, (48) 438.
- gin fires, source and prevention, (42) U.S.D.A. 284.
- ginneries, accounting system, (46) U.S.D.A. 291.
- ginning factory, plans, (41) 828.
- ginning percentages, (44) 635.
- gins, grounding to prevent fires, (49) U.S.D.A. 590.
- grades, manufacturing tests, (46) U.S.D.A. 133.
- grading and prices, (41) N.C. 695.
- growing contest, (43) 436.
- growing in British Empire, (45) 342.
- growth and manufacture, (44) 393.
- growth on alkali land, (42) N.Mex. 829.
- hail-damaged, notes, (49) Tex. 429.
- hair—
 - breaking load, (50) 736.
 - cell wall structure, (50) 629.
 - clinging power, (50) 31.
 - convolutions in, (50) 831.
 - destruction by microorganisms, (49) 646.
 - removing surface liquids from, (49) 132.
 - rigidity, (49) 131.
 - structure, (48) 32.
 - structure and botanical aspects, (49) 528.
 - torsion constant, (48) 732.
- handling and marketing, problems, (42) 189.
- handling under Warehouse Act, (41) U.S.D.A. 695.
- heritable variations in, (45) 341.
- home-grown and Mississippi seed, comparison, (41) N.C. 638.
- hybrid, segregation and correlation of characters in, (50) U.S.D.A. 24.
- improvement, (41) 439; (44) 137, 734; (45) 228; (46) 830; (49) N.C. 733.
- improvement in Bengal, (50) 828.
- improvement in India, (41) 522, 529, 531, 640, 828.
- improvement of seed, (43) 244; (47) N.C. 528.
- in British Empire, increased value, (42) 232.
- in current literature, (49) 131.
- inbreeding, importance, (50) 732.
- Indian, types, (49) 131.
- industry—
 - commercial parasitism in, (44) 138.
 - in Antigua, (46) 226.
 - in British Virgin Islands, (42) 230.
 - in France, (47) 393.

Cotton—Continued.

- industry—continued.
 - in French Africa, (42) 230.
 - in Montserrat, (44) 827.
 - in Nigeria, (48) 335.
 - in north Brazil, (50) 830.
 - in Nyasaland, (42) 438.
 - in United States, survey, (44) 735.
 - in West Indies, (41) 528, 825, 891.
 - Research Association, British. (44) 829.
 - summary, (49) 528.
 - treatise, (41) 531.
- infested by boll weevil, condition of plants, (49) U.S.D.A. 432.
- inheritance of corolla color, (46) 31.
- inheritance of number of boll loculi in, (50) 632.
- inheritance studies, (45) Tex. 229; (50) 531.
- injury by yellow bear caterpillar, (41) 256.
- insect pollination, (49) U.S.D.A. 227.
- insects affecting, (43) 252, 450; (44) 548; (45) 359, 658; (47) 551; (48) 550; (49) V.I. 352; (50) 51, V.I. 555.
- insects in Anglo-Egyptian Sudan, (49) 758.
- insects in Egypt, (42) 545.
- insects in India, (45) 656.
- insects in Porto Rico, (43) 252.
- insects in South Africa, (46) 656.
- insects in South Wales, (49) 758.
- internal boll disease, (41) 251.
- investigations, (50) S.C. 638.
- investigations of Imperial Institute, (41) 531.
- irrigation experiments, (42) Calif. 823; (43) Ariz. 137; (44) 633; (46) 436, 634; (50) U.S.D.A. 132.
- irrigation methods, (44) U.S.D.A. 734.
- Jassid-resistant, (50) 436.
- kidney, history, (44) 527.
- "Kumpta," improvement, (44) 829.
- lace-bug, control, (49) V.I. 352.
- late and early chopping, (41) Ga. 32.
- law, Egyptian, (46) 32.
- leaf blister mite, inheritance of immunity to, (41) 530.
- leaf perforator, notes, (42) Ariz. 357; (43) U.S.D.A. 352.
- leaf spot, angular, (41) S.C. 50.
- leaf worm, notes, (42) Ariz. 357; (45) 554.
- leaves, feeding value, (42) Tex. 531.
- legislation in Tropics, (42) 599.
- length of stigma and fiber, interrelation, (48) 829.
- lime requirements, (46) R.I. 233.
- linkage relations in, (50) 633.
- lint characters, (44) 635.
- lint, computing yields, (44) 435.
- lint frequency, (43) Ark. 530.

Cotton—Continued.

- linters, properties, (50) 505.
- malformation in India, (45) 649.
- manuring experiments, (43) U.S.D.A. 134.
- marketing, (47) 296, 894.
- marketing and research in India, (48) 732.
- marketing conditions in Arkansas, (44) 635.
- marketing, cooperative, (44) 691.
- marketing, cooperative, in Arkansas, (50) 593.
- materials, mechanical testing, (50) 234.
- Meade, (46) U.S.D.A. 833.
- methylene blue absorption by, (50) 413.
- mill practice and equipment, (45) 895.
- milling in Germany, (44) U.S.D.A. 491.
- moth, *see* Alabama argillacea.
- new disease, (47) Ark. 748.
- night soil as fertilizer for, (45) 816.
- nitrogenous fertilizers for, relative value, (43) N.C. 427.
- oil content, (45) Miss. 130.
- pests affecting, (50) 256.
- pests and diseases in British Colonies, regulations, (48) 335.
- pests in India, (47) 254.
- pests, minor, in Egypt, (50) 52.
- Pilion, description, (46) 230.
- Pima, industry of Arizona, (48) 335.
- Pima, pollination, (46) 31.
- Pima, self-fertilization and cross-fertilization, (49) U.S.D.A. 226.
- Pima, summer irrigation, (49) 330.
- Pima, uniformity, (48) U.S.D.A. 229.
- Pima, uses, (50) U.S.D.A. 435.
- plant, analyses, (42) Tex. 530.
- planting and harvest dates, temperature influence on, (41) U.S.D.A. 716.
- planting rate, (46) Tex. 329.
- plants, growth of fruiting parts, (50) 30.
- plants, perennial, productivity, (44) 138.
- plants, young, mineral nutrition, (46) 629.
- plasticity, (50) 830.
- position in American agriculture, (49) U.S.D.A. 389.
- prices, high, justification, (42) 189.
- production, (48) U.S.D.A. 290.
- production—
 - and distribution, (44) 829; (46) 635.
 - improvements, (46) U.S.D.A. 439.
 - in Brazil, (43) 292.
 - in British Empire, (45) 634; (46) 391; (47) 736.
 - in China, (46) 32.
 - in Gujarat, (47) 335.
 - in irrigated areas of South Australia, (50) 535.
 - in irrigated Southwest, (45) 534.

Cotton—Continued.

production—continued.

- in Missouri, (49) 228.
 - in Nyasaland, handbook, (46) 227.
 - in Peru, (48) 393.
 - in West Indies, (45) 33.
 - statistics of 1921-22, (49) 228.
 - under boll weevil conditions, (50) S.C. 639.
 - products for steers, (45) Ariz. 873.
 - project study outlines, (44) 596.
 - properties and uses, (50) 534.
 - raooneing experiments, (46) 832; (50) U.S.D.A. 132.
 - raw, measurable characters, (50) 735.
 - raw, testing for humidity, (49) 331.
 - reginned and cleaned, (46) 635.
 - relation to temperature and rainfall, (50) 415.
 - research in British Empire, (49) 398; (50) 701.
 - resistance to alkali, Ariz. (43) 724; (44) 519.
 - riding plows for, (41) U.S.D.A. 696.
 - rogueing, (47) 228.
 - rôle in economic progress and international trade, (49) 94.
 - root aphid, life history and habits, (46) S.C. 747.
 - root mold, notes, (45) N.C. 443.
 - root rot, control, (46) Tex. 343; (47) U.S.D.A. 447; (50) U.S.D.A. 146.
 - root rot fungus, habits, (50) 747.
 - root rot in Arizona, (49) 246.
 - root rot in rotations, (45) 246.
 - root rot, notes, (43) Okla. 44, 652; (45) 647.
 - root rot spots, (42) 449.
 - root tips, excised, cultivation under sterile conditions, (49) 627.
 - rotation experiments, (43) Okla. 32; (44) 632; (45) 532; (46) 437; (47) S.C. 24, Miss. 216, La. 428; (48) 629; (49) Tex. 429; (50) U.S.D.A. 132.
 - sales methods of farmers, improvement, (42) U.S.D.A. 339.
- Sea Island—
- and Meade, spinning tests, (45) U.S.D.A. 38.
 - culture, (45) V.I. 232.
 - diseases and insect pests, (45) V.I. 232.
 - fertilizer experiments, (41) 528; (45) 33; (46) 31.
 - growth and abscission in, (48) 438.
 - improvement, (41) 531; (42) 634.
 - manuring experiments, (47) 632.
 - variety tests, (50) 28.
- seed, *see* Cottonseed.
- seeding experiments, (44) 230; (50) U.S.D.A. 132.
- seedlings, abnormal development, (41) 429.

Cotton—Continued.

- selection experiments, (41) 531, N.C. 638, 825, 828; (43) Ark. 739.
- slug, notes, (41) 455.
- soils, black, of India, fertilizer experiments, (41) 814, 816, 817.
- soils, hydrogen-ion concentration of, (47) 722.
- soils of middle Niger, analyses, (49) 616.
- soreshin, notes, (46) 846; (49) 842.
- spacing and thinning tests, (41) Ark. 140.
- spacing experiments, (41) Tex. 36; (45) Miss. 126, Miss. 130, Miss. 224, 634; (47) Ga. 427, Miss. 428, Ark. 732; (48) Miss. 229; (49) Miss. 222, Miss. 226, Tex. 429; (50) U.S.D.A. 132.
- species, microscopic diagnosis, (45) 37.
- spinning tests, (41) 825; (44) 827; (49) U.S.D.A. 331.
- spinning tests, handbook, (48) 32.
- spraying experiments, (46) 32.
- square daubers, notes, (42) Ariz. 357.
- squares, insects affecting, (41) Fla. 548.
- stainer, control, (49) V.I. 352.
- stainer in Peru, (45) 860.
- stainer, life history and control, (42) 851.
- stainer on avocado, (43) 851.
- stainer, southwestern, notes, (42) Ariz. 357.
- stainers, notes, (41) 251, 455; (45) V.I. 150; (49) 758.
- stalk hurds, protein content, (41) Ariz. 367.
- stalks, dried, analyses and feeding value, (45) 376.
- stalks, green, palatability of silage from, (49) Ga. 524.
- Standards Act, regulations, (50) U.S.D.A. 293.
- statistics, U.S.D.A., (42) 731; (48) 290.
- stem weevil in India, (43) 450.
- stem weevil, notes, (50) 57.
- sucker, experiments, (48) Calif. 528.
- supply, distribution, and consumption, (49) 331.
- tests of samples, (45) 340.
- Texas, correlation of characters, (50) 633.
- Texas root rot, control, (50) Tex. 45.
- Texas, staple, of (44) Tex. 230.
- the universal fiber, (49) 528.
- thinning and spacing, (49) Ga. 524.
- thrips, history and habits, (47) 850.
- thrips, studies, (42) Ariz. 357; (46) 559.
- time of applying potash, (46) S.C. 725.
- time of applying sodium nitrate, (43) Ala.Col. 233.
- time of maturity, factors affecting, (43) Ga. 136.

Cotton—Continued.

time of thinning, (49) Tex. 429.
 top, analyses, (44) Ariz. 568.
 trade, report of Federal Trade Commission, (49) 693.
 treatise, (45) 342; (50) 694.
 upland long staple, value, (43) Ark. 531.
 utilization in cellulose industry, (41) 734.
 varieties, (45) Ga. 38; (47) La. 428, Ark. 731; (48) U.S.D.A. 223, Miss. 228, Tex. 335; (49) Miss. 330; (50) S.C. 639, Miss. 828.
 varieties, improved, in India, (41) 531, 640, 828.
 varieties in Argentina, (46) 635.
 varieties, sap properties, (49) 24.
 varieties, spinning tests, (49) U.S.D.A. 33.
 variety tests, (41) Ga. 31, Tex. 35, Ark. 141, Fla. 527, 529, Mo. 637, N.C. 638, 734; (42) 132, 436, Calif. 823, N.Mex. 829; (43) Tex. 33, U.S.D.A. 134, Ga. 136, Tex. 230, U.S.D.A. 329, N.Mex. 332, N.C. 434, Ark. 436, La. 636, 637, Mo. 736; (44) 137, V.I. 332, 433, S.C. 524, 527, 632, 633, 635, 733, 827; (45) Miss. 126, Miss. 130, Miss. 223, Mo. 224, Tex. 232, Okla. 430, 532, 734; (46) 227, Tex. 329, 436, 437, 634, S.C. 725, Guam 726; (47) Miss. 227, Tex. 228, Ga. 427, Miss. 428, U.S.D.A. 430, 632, Okla. 823; (48) 434, Calif. 528, 530, Ga. Coastal Plain 628, 629, S.C. 629, Calif. 631, Miss. 632, Ala. 732; (49) Miss. 222, Miss. 225, Guam 427, 428, Okla. 428, Tex. 429, Okla. 432, N.Mex. 525; (50) 28, U.S.D.A. 132, S.C. 637, 828.
 variety tests in China, (42) 400.
 warehouses, construction and fire protection, (42) U.S.D.A. 390.
 warehouses, regulations, U.S.D.A. (41) 640, 692, 695; (42) 34; (43) 896; (48) 93; (50) 293.
 warehouses, regulations in North Carolina, (44) 593.
 warehouses, regulations, revision, (43) N.C. 490.
 water supply, relation to maturity, (49) 842.
 water-stress behavior in Arizona, (47) U.S.D.A. 133.
 weather damage tests, (49) U.S.D.A. 33.
 wild, and insect enemies, (47) 53.
 wild, distribution, (44) Ariz. 548.
 wild, new species, (46) 31.
 wilt, a seed-borne disease, (49) 246; (50) 748.
 wilt, cause, (47) 46; (49) 648.
 wilt, control, (43) 244; (50) 45.
 wilt in Egypt, (46) 847.

Cotton—Continued.

wilt, notes, (42) 148; (43) 243.
 wilt organism, transmission, (47) Ark. 748.
 wilt-resistant, breeding, (44) 542; (45) Ala.Col. 38.
 wilt-resistant varieties, (50) 243.
 woolly mite, notes, (43) 51; (47) 357.
 worm, notes, (43) Ala.Col. 55, 252; (45) V.I. 150.
 yarns, tensile strength, determination, (47) 229.
 yield cycles, (41) 892.
 yields, (45) V.I. 126; (49) La. 824.
 yields, effect of thinning, (49) N.C. 733.
 yields, increasing, (48) N.C. 528.
 yields of seed, (45) Miss. 223.

Cottonseed—

absorption of hydrocyanic acid by, (49) U.S.D.A. 457.
 analyses, (45) U.S.D.A. 827.
 and products, physiological value and toxicity, (45) 74.
 and products, transactions in, rules, (46) 32.
 cake, analyses, (41) Ind. 868; (42) Tex. 769, 770; (45) Tex. 68; (46) Tex. 675; (48) 68.
 cake, analysis methods, (45) 109.
 cake, feeding value, (41) U.S.D.A. 565, Nebr. 770, 771; (42) Nebr. 169; (49) Nebr. 671.
 cake, fertilizing value, (41) 816.
 cake for wintering beef cows, (44) Mont. 364.
 cold pressed, analyses, (41) Ind. 564; (42) Tex. 769; (46) Tex. 675.
 cold pressed, feeding value, (42) Tex. 369.
 culture and expression of oil, (43) 240.
 disinfecting, (50) 53.
 distribution in 1921, (46) U.S.D.A. 834.
 effect on growth and reproduction of cows, (47) N.C. 580.
 fat, digestibility, (47) U.S.D.A. 560.
 feed, analyses, (41) N.H. 68, Conn. State 176, Ind. 564, Ind. 868, N.Y. State 868; (42) Mich. 63, 203, Tex. 769, Mass. 866; (43) N.J. 69, Ky. 373, N.J. 672, 876; (44) Mich. 568; (45) Tex. 68, N.Y. State 469, N.J. 774, 872, Vt. 872; (46) Mich. 168, Tex. 675, 871; (47) N.Y. State 172, 275, Ind. 473, Conn. State 570; (48) 68.
 feed and meal, analyses, (44) 267.
 feed, composition and retail prices, (44) Conn. State 176.
 feeding value, Tex. (42) 369; (49) 469; (50) 70.
 fertilizing value, (45) Miss. 37.
 from several sources, (49) Tex. 429.
 fumigation, (49) 154.
 germination, (50) 740.

Cottonseed—Continued.

- globulin, digestibility in vitro, (50) 360.
- gossypol in, variation and relation to oil in, (50) 111.
- hairs, cell wall structure, (50) 629.
- hairs, daily growth rings in, (43) 633.
- home-grown, value, (46) Miss. 532.
- hulls, acid hydrolysis, (44) 809.
- hulls, analyses, (41) Ind. 564; (42) Ind. 769; (43) Ind. 867; (44) Mich. 568.
- hulls as litter for poultry, (41) 871.
- hulls, digestibility and productive value, (47) Tex. 472.
- hulls, feeding value, (44) Tex. 868; (49) N.C. 773.
- in relation to community production, (46) U.S.D.A. 229.
- marketing, (47) U.S.D.A. 134.
- meal—
 - amino acid content, (41) 367; (46) 504, 505.
 - analyses, (41) N.H. 68, Conn.State 176, Ind. 564, R.I. 564, Can. 565, Ind. 868, N.Y.State 868; (42) Mich. 63, 263, 526, 560, Ind. 769, N.H. 769, Tex. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, Vt. 464, N.J. 672, 867; (44) Wash. 471, Ariz. 568, Mich. 568, N.H. 671, Pa. 769; (45) Tex. 68, N.Y.State 469, 522, N.J. 774, 775, 872, Vt. 872; (46) Mich. 168, N.H. 675, Tex. 675, 871; (47) N.Y.State 172, Mass. 274, 275, Ind. 473, N.J. 570, R.I. 571, 668; (48) 68, Me. 68, Can. 368.
 - and corn, feeding value, (50) Miss. 69.
 - and corn silage for beef production, (47) 278.
 - and feed, analyses, (43) R.I. 672, Ind. 867; (44) Mass. 671; (45) 872, R.I. 872.
 - and hulls, feeding value, (44) 266; (50) Tex. 775.
 - and silage, feeding value, (46) Tenn. 169.
 - and soy beans, comparison, (43) Ind. 570.
 - as affected by heating, (43) N.C. 411.
 - as pasture supplement, (42) Va. 470.
 - as source of ammonia in composts, (43) 127.
 - as source of protein for egg production, (47) 871.
 - carbon dioxid and ammonia formation from, (41) 421.
 - composition and retail price, Conn.State (44) 176; (45) 375; (47) 570.
 - composting with rock phosphate, (47) Ga. 420.

Cottonseed—Continued.

- meal—continued.
 - crude fiber standards, (41) 564.
 - digestibility, (48) 574; (50) Mass. 168.
 - effect on egg production, (46) Mo. 370.
 - effect on lime requirements of soil, (44) Pa. 723.
 - effect on milk fat percentage, (47) 278.
 - effect on reproduction in animals, N.C. (49) 773, 780.
 - feeding, effect on storage of eggs, (44) Calif. 774.
 - feeding, tissue changes from, (49) 178.
 - feeding value, (41) Ind. 69, Kans. 69, Tex. 78, 369, 569, Nebr. 770, 771; (42) Kans. 372; (44) Pa. 770; (46) Tex. 365, Ind. 477, Wyo. 676; (47) Md. 73, N.Mex. 475, N.C. 576, Ark. 776; (48) Mo. 666; (49) 69, Ind. 267, Miss. 267, 465, Tex. 469, N.C. 773, Iowa 774, Wyo. 867, N.Mex. 868, Miss. 869, N.Mex. 869; (50) Miss. 65, Tex. 70, Mich. 474.
 - fertilizing value, (41) Tex. 35, Ark. 130, Ala.Col. 336, N.C. 625; (43) Tex. 33, Tex. 37, Ala.Col. 135, La. 627; (45) Ala.Col. 119; (47) La. 428; (49) Tex. 436, 834.
 - for horses, (44) U.S.D.A. 571.
 - for lambs, (42) Calif. 868.
 - for laying hens, (41) Ind. 570, N.Mex. 571; (43) N.Mex. 378.
 - gossypol content, (45) N.C. 410.
 - grades, (44) 364.
 - injury, causes, (46) 281.
 - long-continued feeding, effect on fertility of hogs, (47) Okla. 868.
 - moisture content, determination, (42) S.C. 413.
 - nitrogen availability in, (43) Ala.Col. 135; (47) Tex. 217.
 - poisoning, prevention, (44) U.S.D.A. 867.
 - production in United States, (45) 730.
 - proteins, nitrogen distribution in, (47) 201.
 - proteins of, (46) 505.
 - raffinose from, (47) 202.
 - retail prices, (42) U.S.D.A. 331.
 - standards, (42) Tex. 168.
 - toxicity, effect of autoclaving, (50) 468.
 - v. linseed meal, feeding value, (47) Wyo. 572.
 - v. tankage for laying hens, (49) Tex. 470.
 - v. velvet beans for cows, (49) Miss. 471.

Cottonseed—Continued.

- milling process, (45) 872.
- mixing, (46) U.S.D.A. 834.
- oil—
 - analysis, (45) 806.
 - as motor fuel, (45) 690; (49) 590.
 - catalytic hydrogenation, (50) 610.
 - color standards, (41) 714.
 - composition, (43) 502.
 - digestibility, (45) 62.
 - hardened, arsenic and nickel content, (42) 610.
 - hydrogenated, food value, (45) 367.
 - hydrogenated, use in manufacture of tin plate, (42) 508.
 - industry in America, (42) 32; (44) 714.
 - losses in refining, (49) 311.
 - mills, data, (43) 817; (47) 728.
 - phytosterols in, (50) N.Y.State 408.
 - production, (46) 636.
 - rancidity detection, (44) 13.
 - rancidity in, factors affecting, (48) 414.
 - sterilization for preparation of lipovaccines, (42) 707.
 - vitamin A in, (43) 764.
- poisoning of ewes by, (42) Okla. 265.
- poisoning, studies, (50) 479.
- production, (50) U.S.D.A. 132.
- production from poisoned varieties, (48) Ga.Coastal Plain 128.
- production in French colonial possessions, (42) 32.
- products, analysis, (45) 719.
- products, digestibility, (47) Tex. 472.
- products, feeding value, (44) Tex. 868.
- products, gossypol in, (43) N.C. 411.
- products, safeguarding feeders of, (42) Kans. 64.
- products, sampling and examination, (43) 805.
- products, use in stock feeding, (44) U.S.D.A. 867.
- removal of fibers from, (41) 532.
- treatment, (43) 161, 845.
- vitality, (50) 349.

Cottonwood—

- description and distribution, (47) 43.
- disease, (43) Ariz. 749.
- for lumber production, (46) Iowa 341.
- leaf beetle, striped, notes, (47) 848.
- leaf-mining beetles on, (42) 454.
- trees, chlorosis of, (49) N.Mex. 548.

Cottonwoods, cytospora canker on, (47) Ariz. 754.

Cottony cushion scale—

- host list, (41) 457.
- in Florida, (44) 353.
- notes, (43) 554.

Cotugnia spp., notes, (44) 379.

Cotyledons—

- evolution of, (43) 133.
- food reserve in, (46) 324.
- nutritive value of food reserve in, (45) 334.

Cotylophalius n.g. and n.spp., description, (44) 158.

Couch grass rhizomes, feeding value, (42) 369.

Coumarin in vanillin, detection, (45) 13.

Country—see also Rural.

- and town relationships, factors in, (48) 892.
- and town, service relations, (50) Wis. 691.
- estates, water supply installations, (48) 786.
- homes, see Farm homes and Rural homes.
- house, plans and specifications, (43) 289.
- life and occupations in England, (50) 594.
- Life Conference, proceedings, (50) 893.
- life conferences, (41) 590, 591, 707.
- newspaper, treatise, (49) 595.
- relation with city in Germany, (42) 687.
- theater, plays for, (44) 192; (48) 693.
- weekly in New York State, (46) 89.

County—

- agent and extension specialist, responsibility, (49) 492.
- agent and farm bureau, (48) 192.
- agent work in North and West, U.S.D.A. (42) 299; (44) 94; (46) 94.
- agent work, status and results, (48) U.S.D.A. 394.
- home bureau, (47) Ill. 194.

Couturea phalaridis n.sp., description, (49) 445.

Cover crops—

- and fertilizers for orchards, (50) 440.
- chemical composition during growth, (42) Va. 427.
- culture in Nigeria, (43) 637.
- effect on oranges, (48) Calif. 533.
- effect on orchard temperature, (48) 113, U.S.D.A. 508.
- experiments, (43) Md. 133.
- for apples, (49) Mont. 136.
- for citrus fruits, value, (48) Calif. 447.
- for orchards, (43) Ind. 338; (47) Wash.Col. 535; (49) Wash.Col. 232.
- notes, (48) S.C. 629.
- relative values, (45) 741.

Cow—

- barns, see Dairy barns.
- champion dairy, (45) 380.
- manure, decomposition, (44) 511.
- manure, fertilizing value, (41) 814.
- manure, nitrification, studies, (46) 714.

Cow—Continued.

- manure v. fertilizers, (44) R.I. 23.
- manure with straw or shavings, fertilizing value, (50) R.I. 520.
- manure with wood ashes, fertilizing value, (49) 516.
- serum as colostrum substitute, (48) 180; (50) 479.
- sheds, plans and construction, (48) 386.
- stables, concrete, construction, (43) 90.
- stables, plans, (42) 489; (43) 592.
- stalls, construction, (41) Mich. 587; (50) 590.
- testing associations, (48) 773.
- testing associations, advantages, (45) U.S.D.A. 777.
- testing associations in California, (42) Calif. 172.
- testing associations in Wisconsin, (47) 279.
- testing associations, manual for, (48) 274.
- testing in Michigan, (48) Mich. 396.
- Cowbird in yellow throat's nest, (41) 753.
- Cowhides, trade in India, (44) 573.

Cowpeas—

- and soy bean hay, comparison, (45) Mo. 224.
- anthracnose, notes, (48) 741.
- bacterial spot, studies, (49) 246.
- chlorosis, effect of excessive lime, (49) 517.
- diseases, (44) U.S.D.A. 36; (48) Del. 643.
- hay, analyses, (44) Ariz. 568.
- hay, cost of production, (42) Mo. 188.
- hay, feeding value, (47) N.Mex. 669.
- hay, nitrifiability, (46) 516.
- leaf spot, notes, (48) 741.
- leaves, temperature, (50) 425.
- mildew, notes, (48) 741.
- mosaic, notes, (48) 243.
- pod rot, notes, (45) N.C. 443.
- rust, notes, (48) 741.
- seeds, manganese content, (49) 731.
- weevil, four-spotted, control, (43) Okla. 51.
- weevil, four-spotted, life history and control, (42) Okla. 856.
- weevil, function of prothoracic plate, (45) 657.
- weevil, studies, (43) Tex. 561; (48) Hawaii 355.

Cowpeas—

- acreage and planting time, (44) P.R. 433.
- analyses, (47) Va. 823.
- and corn, hogging down, (49) La. 272.
- and corn, intertillage, (49) Tex. 429.
- and kafir, culture experiments, (45) Okla. 430.
- and millet varieties, comparison, (48) Ga.Coastal Plain 628.
- and soy beans, comparative yields, (41) Mo. 637.

Cowpeas—Continued.

- as chinch bug control crop, (49) Ill. 431.
- as cover crop, (46) Guam 726; (47) Ill. 830; (48) 139.
- as cover crop for peaches, effect, (46) 444.
- as green manure, (41) Del. 136, Mo. 624; (42) Guam 31, Miss. 622; (43) Md. 122, U.S.D.A. 134, Ariz. 733; (46) 320; (47) Miss. 217.
- as hay and pasture crop, (45) U.S.D.A. 86.
- as hay crop, (44) R.I. 335.
- as orchard cover crop, (41) Kans. 41, Del. 145; (44) Ariz. 532.
- Bacterium solanacearum on, (42) 352.
- breeding experiments, (41) 528, N.C. 638; (45) 33, 734; (48) P.R. 227; (50) P.R. 533.
- cross-inoculation tests, (41) 523.
- culture, (47) N.Mex. 333; (48) Calif. 527.
- culture and varieties, (44) U.S.D.A. 36.
- culture experiments, (41) 333, Mo. 637; (42) Tex. 828; (44) P.R. 433, Ariz. 523, Va. 732; (45) Kans. 33, Guam 34; (49) Tex. 429.
- culture on sandy soils, (41) Wis. 18.
- culture, suggestions to teachers, (44) U.S.D.A. 698.
- digestibility coefficients, (48) 574.
- early growth in alkali soil, (42) Utah 28.
- economic value, (43) U.S.D.A. 794.
- effect of acidity on inoculation and growth, (45) Wis. 213.
- feeding value, (50) Miss. 68.
- feeding value, factors affecting, (48) 67.
- fertilizer experiments, (41) Kans. 33, Fla. 527; (43) Okla. 32.
- for North Carolina, (41) N.C. 434.
- for silage, (41) Mo. 334.
- fumigated, hydrocyanic acid absorption and retention by, (49) U.S.D.A. 456.
- Fusarium root rot on, (42) 247.
- germinated, antiscorbutic value, (47) 568.
- growing with corn, (41) Tex. 36.
- hay yields, (43) Mo. 736.
- improvement by selection, (46) 830.
- inheritance of characters, (41) 828.
- insects affecting, (44) U.S.D.A. 36.
- liming experiments, (45) Miss. 126; (46) 426.
- nitrification in South African soil, (46) 515.
- nitrogen fixation by, (47) 627.
- nodule formation, effect of pH, (47) 435.
- notes, (48) Hawaii 330.
- planted with corn, (47) Miss. 216; (48) S.C. 628.

Cowpeas—Continued.

popular account, (44) U.S.D.A. 230.
 rotation experiments, (41) Kans. 32,
 Kans. 33; (43) Okla. 32; (47) Miss.
 216, La. 428.
 seed crop, marketing, (48) U.S.D.A.
 891.
 seed production, (43) Mo. 736.
 seed production maps, (41) U.S.D.A.
 236.
 seeding experiments, (41) Tex. 36.
 storage experiments, (46) 226.
 sunburn and aphid injury, (48) Ariz.
 451.
 utilization, (44) U.S.D.A. 332.
 v. soy beans for pigs, (50) 471.
 varieties, behavior, (48) Guam 228.
 variety tests, (41) Tex. 35, Ariz. 331,
 Mo. 637, N.C. 638; (43) Okla. 32,
 Tex. 33, Md. 133, U.S.D.A. 134, La.
 636, Ariz. 733, Mo. 736; (44) P.R.
 433; (45) Mo. 224; (46) Hawaii
 633; (47) Okla. 824; (49) Va. 134,
 Guam 426, Tex. 429; (50) V.I. 533.
 viability as affected by heat, (41) 430.
 yields, (49) Ohio 733, La. 824.

Cowpox—

and chicken pox, relationship, (49)
 379.
 and foot-and-mouth disease, reciprocal
 immunity, (48) 879.
 and sheep pox, relationship, (47) 285.
 prophylaxis and treatment, (41) 576.
 virus, relation to chicken pox, (44)
 183.
 virus, studies, (49) 378.

Cows—*see also* Calves, Cattle, and Heifers.

Aberdeen-Angus, famous, (41) 768.
 aborting, time data, (49) Ky. 581.
 advanced-registry feeding, (43) Pa.
 577.
 advanced-registry requirements, (45)
 Me. 677.
 advanced-registry tests, (43) Calif. 576,
 Kans. 677.
 advanced-registry tests, preliminary
 milking in, (46) 879.
 age, effect on milk fat percentage, Me.
 (44) 178, 271, 675.
 age relation to production, (48) 874.
 alfalfa hay and silage for, (41) Ariz.
 371.
 alfalfa hay for, (41) Mass. 275, 371.
 and milk production, treatise, (50)
 577.
 Ayrshire, milk records, analysis, (43)
 74.
 Ayrshire, variation, (42) 69, Me. 70.
 bacterial flora of udders, (47) 381.
 balancing rations for, (48) 478.
 barley v. corn for, (44) Wis. 271.
 body secretions in relation to milk
 production, (46) Ky. 373.
 calcium and phosphorus equilibrium
 in, maintaining, (48) 477.
 calcium balance, (49) 779.
 carbon dioxid capacity, (46) 74.

Cows—Continued.

care at calving time, (43) Wash. 197;
 (45) Mich. 899.
 cassava meal for, (43) 73.
 cellulose as emergency feed for, (43)
 170.
 cellulose fermentation in rumen, (46)
 69, 70.
 changes in composition, (50) Mo. 868.
 condition at parturition, effect on milk,
 (41) Mo. 677.
 conformation relation to milk yield,
 (45) 678.
 corn bran for, (41) Mass. 276.
 cost of production, (49) N.Y. Cornell
 691.
 costs and returns, (47) N.Y. Cornell
 578.
 cottonseed cake for, (43) Ariz. 777.
 cull, disposal, (48) 875.
 dairy, competition, Calif. (43) 876;
 (49) 275.
 dairy, feeding stuffs for in California,
 (42) Calif. 71.
 dairy, judging in relation to milk
 yield, (43) Me. 175.
 dairy, milk yield in relation to age,
 (43) Me. 174.
 dairy, nitrogen metabolism, (43)
 S.Dak. 873, Va. 874.
 dairy, production in New Zealand, (41)
 676.
 dairy, purebred, testing, (43) 73.
 dairy record and feeding chart, (43)
 176.
 dairy, self-feeders for, (42) Va. 471.
 diet, effect on vitamin in milk, (47)
 78.
 digestion coefficients, (47) Va. 477.
 digestion experiments, (46) Mass. 476.
 diseases of digestive system, (47) 80.
 diseases of oviduct, (45) 885.
 diseases of oviduct, relation to steril-
 ity, (45) 381.
 diseases of the udder, (45) 781.
 dry, body temperature, (44) 479; (45)
 173.
 early v. late calving, (47) Miss. 280.
 effect of age of parent on quality of
 offspring, (48) 873.
 effect of calcium feeding, (48) Del.
 670.
 effect of early breeding, (37) 278.
 effect of environment and breeding,
 (41) Iowa 182.
 escutcheons, (41) 572.
 escutcheons, biometrical and heredi-
 tary studies, (48) 874.
 escutcheons in relation to milk pro-
 duction, (46) Ky. 373.
 fall-freshening, management, (45)
 Wash. 777.
 feces, bacterial content, (50) 475.
 feed requirements, (48) 576, 668.
 feeding, (41) 473, 676; (42) 269; (48)
 273, 773.

Cows—Continued.

feeding and management, (48) Mont. 771; (49) 375; (50) Ill. 73, 277.
 feeding experiments, (41) Tex. 78, Mass. 275, Mass. 276, Can. 572; (42) Guam 74, Kans. 264, Wis. 376, Calif. 874; (43) 270, N.Mex. 777; (44) Ariz. 573, Calif. 775; (45) 71, 165, Ariz. 475; (46) Kans. 478, Calif. 576, U.S.D.A. 675, 678, Hawaii 679; (47) 76, 77, Iowa 78, 378, Va. 476, 478, Pa. 478, Iowa 479, Wis. 479, Ga. 480, N.C. 480, 782, Ariz. 876; (48) S.Dak. 70, Vt. 173, N.Mex. 266, 376, Oreg. 576, S.C. 670, Wyo. 768, 769, 770, Can. 875; (49) Mont. 172, Miss. 471, Pa. 472, Ga. 578, Idaho 778; (50) S.C. 73, Can. 375.
 feeding for advanced-registry test, (46) 273.
 feeding for winter milk production, (49) 874.
 feeding in Hawaii, (48) 169.
 feeding, principles, (49) 675; (50) Mo. 874.
 feeding standards, (45) Wis. 273; (47) 278.
 feeding, wet and dry concentrates, (45) 878.
 feeding, winter, (48) West.Wash. 273, 876.
 feeding without silage, (49) 780.
 forced feeding, (43) Pa. 577.
 Friesian, correlation between milk and fat, (49) 677.
 gestation as affecting milk composition, (41) 679.
 grain feeding, heavy v. light, (44) Calif. 270.
 growth, (50) Mo. 466.
 growth, effect of pregnancy, (48) 874.
 growth rate, (45) 378; (49) 374; (50) 474, 578, 874.
 Guernsey, milk records, (43) Minn. 876.
 hay for from immature plants, (41) 762.
 heat production, (45) 490.
 heavy feeding, value, (46) Ill. 577.
 heredity and production in, (44) 271
 Holstein-Friesian, 7-day test, (45) 677.
 in health and disease, (42) 273.
 inheritance of quantity and quality of milk, (42) 771.
 Jersey, milk records, (43) 777.
 judging, (44) 494; (47) West.Wash. 480.
 kudzu as soiling crop for, (43) La. 671.
 maintenance requirements, Vt. (48) 374, 668.
 metabolism experiments, (47) Wis. 479.
 milk production, *see* Milk production.
 mineral metabolism, (41) 372; (44) Ohio 175; (47) 76, 278, 873; (48) Ohio 375.
 mineral requirements, (48) 771.

Cows—Continued.

mineral supplements for, palatability tests, (44) 776.
 minimum of rough fodder in rations, (49) 780.
 mycosis of fetal membranes, cause, (42) 778.
 nitrogen metabolism, (47) 77.
 nutrition and growth, weight-height-age curve, (48) 274.
 occurrence of quadruplets in, (44) 174.
 of Kleinhof-Tapiau, composition and milk production, (50) 176.
 official tests, (41) Ill. 873.
 on pasture, feeding grain to, value, (49) Oreg. 578.
 pasturing experiments, (42) U.S.D.A. 370; (43) U.S.D.A. 468, Minn. 671; (44) U.S.D.A. 775; (46) Kans. 478, U.S.D.A. 771; (47) Mich. 176.
 pasturing experiments on Sudan grass, (49) Kans. 472.
 phosphorus and calcium metabolism, (41) 678; (45) 273.
 potato tops poisoning, (43) 180.
 premature birth in, (46) Mass. 81.
 production and income, effect of season of freshening, (47) U.S.D.A. 580.
 protein requirements, (48) Vt. 173.
 purebred, stock breeding farms for, (49) 374.
 purebred, testing, (47) 380.
 purebred, testing in New South Wales, (46) 771; (48) 274.
 purebred, value, (46) Wash. 498.
 range, feeding experiments, (46) N Mex. 365.
 rations, succulence in, (49) West. Wash. 375.
 records, *see* Dairy herd records.
 relation of production to income from, (47) U.S.D.A. 580.
 reproductive organs of, bacterial flora, (43) 182.
 rice polish feeding, effect on butter fat, (44) 573.
 selection and value, (50) 578.
 shape of lactation curve, (49) 876.
 sick, detecting, (45) 781.
 silage as hay substitute for, (46) 372.
 skin color and fat production, relation, (48) 772.
 soiling crops for, (41) Iowa 181, 184; (43) 777.
 soiling v. silage for, (45) 878.
 stage of lactation as affecting milk composition, (41) 679.
 sterility in, (45) 885; (49) West. Wash. 97; (50) 381.
 sterility in, bacteriology and pathology, (48) 379.
 sterility in, treatment, (43) 683; (44) 581; (45) Wis. 285.
 sunflower silage for, (43) Mont. 68; (45) 72, Colo. 274, 275.
 sunflower v. corn silage for, (44) W.Va. 369, 370.

Cows—Continued.

- testing, (45) Mich. 880.
- thin, fleshing, (45) Ariz. 470.
- time of calving, effect on yearly milk record, (47) 78.
- traumatic pericarditis in, (42) 878.
- treatment of genital tract, (47) 80.
- tuberculin-reacting, Bang system of separating, (44) 880.
- urine analysis, (41) 82.
- uterine mucosa, effects of medicinal agents, (47) Mich. 84.
- variability in, (48) 874.
- velvet bean meal for, (44) Mass. 670.
- viscera of, atlas, (41) 286.
- vitamin requirements, (50) Minn. 175.
- wide and narrow rations, (49) Ohio 375.
- winter feeding, cod liver oil for, (49) 780.
- wintering, sample rations for, (42) U.S.D.A. 264.
- Coyo, description, (41) U.S.D.A. 45.
- Coyo, synonymous with chinin, (42) 537.
- Coyote, methods of destruction, (43) Calif. 250.
- CR indicator, bactericidal action, (42) 775.
- Crab apple, flowering, desirable characters, (47) 240.
- Crab apples—
 - breeding, (49) S.Dak. 533.
 - culture, Minn. (42) 835; (48) 338.
 - culture at high altitudes, (44) Colo. 234.
 - new, description, (48) Can. 37.
 - organic acids of, (46) 308.
 - Siberian, culture, (48) N.Dak. 238.
 - varieties, (42) Minn. 834, S.Dak. 836; (48) N.Dak. 235.
 - varieties, hardy, (44) U.S.D.A. 741.
 - variety tests, (47) Minn. 338.
- Crab grass—
 - composition of ash, (41) 502.
 - effects on cattle, (43) 384.
- Crabs, land and marine, in Burma, (45) 657.
- Crackers, analyses, (47) Calif. 660.
- Cracklings, analyses, (43) N.J. 69.
- Crambinae of North America, studies, (48) 155.
- Crambinae of Nova Scotia, key, (41) 354.
- Crambus—
 - haytiellus on lawns, (46) 659.
 - hortuellus, *see* Cranberry girdler.
 - laqueatellus, studies, (48) 155.
 - mutabilis, summary, (49) 656.
 - praeffectellus on corn, (43) 358.
 - praeffectellus, studies, (43) Conn.State 251; (49) 655.
 - spp. on corn, notes, (42) Ohio 852.
 - spp., summary, (47) U.S.D.A. 458.
- Cranberries—
 - cause of losses, (49) Wash.Col. 241.
 - culture, (48) N.J. 539.
 - culture, effect of cloudiness on bog water, (46) 632.
 - culture experiments, (44) Alaska 336.

Cranberries—Continued.

- culture in Quebec, (42) 238.
 - culture on Cape Cod, (48) 790.
 - fertilizer experiments, (42) 441, N.J. 837; (43) Mass. 147; (44) N.J. 338; (45) N.J. 216; (46) N.J. 540; (48) N.J. 342.
 - fertilizer formula, (44) 146.
 - food and effect of flooding, (48) N.J. 354.
 - growing in Massachusetts, (49) 237.
 - handling and shipping, (41) 836.
 - in storage, fungi affecting, (44) Mass. 848.
 - insects affecting, (43) Mass. 158; (46) Mass. 52, N.J. 557; (47) Mass. 452; (50) Mass. 659.
 - keeping quality, relation to spring temperatures, (48) 838.
 - proposed investigations, (42) N.J. 837.
 - pruning experiments, (41) 836.
 - spoilage after picking, (41) 836.
 - spray residue on, (47) U.S.D.A. 360.
 - spraying experiments, (43) U.S.D.A. 843; (44) 450; (47) Mass. 453, U.S.D.A. 456.
 - storage, analyses, (44) Mass. 801.
 - storage experiments, (43) Mass. 146.
 - varieties, keeping quality, (47) Mass. 441.
 - water-raking and keeping quality, (45) U.S.D.A. 642.
 - winterkilling and frosts, (43) Mass. 119.
- Cranberry—
- black-head fireworm, control, (43) Mass. 159.
 - bogs, forecasting minimum temperatures, (48) U.S.D.A. 509.
 - bogs, gipsy moth on, (48) U.S.D.A. 253.
 - bogs, weed eradication, (44) Oreg. 826.
 - diseases, (43) Mass. 155; (44) 450; (45) U.S.D.A. 54; (50) Mass. 656.
 - end-rot fungus, notes, (44) 156.
 - false blossom, varietal susceptibility, (45) 547.
 - fireworm, control, (49) Wash.Col. 251.
 - fruitworm, egg parasitism, (47) Mass. 452.
 - fruitworm, notes, (45) 551.
 - fruitworm, parasite of, (41) 63; (43) Mass. 159.
 - fungus disease and injuries, (47) Mass. 450.
 - girdler, control, (44) N.J. 351.
 - girdler, notes, (47) Mass. 452.
 - girdler, parasites of, (46) Mass. 52.
 - growers' marketing organization, studies, (48) U.S.D.A. 789.
 - industry in Canada, (50) 38.
 - industry in New Jersey, survey, (47) 834.
 - industry, value of peat investigations to, (50) 321.
 - insect survey, (50) 153.

Cranberry—Continued.

- plants, submerged, as affected by cloudiness, (43) 836.
- root grub, notes, Mass. (43) 158; (47) 452.
- rootworm beetle as apple pest, (44) 854.
- rots, studies, (44) Mass. 848.
- soils, treatment for acidity, (44) N.J. 316.
- spanworm, notes, (43) Mass. 158; (45) 551; (47) Mass. 452.
- spittle insect, control, (43) Mass. 158.
- storage rots, control, (45) U.S.D.A. 54.

Crane flies—

- biology and phylogeny, (46) N.Y.Cornell 57.
- of New York, (42) N.Y.Cornell 157.
- range, in California, (45) U.S.D.A. 256.
- studies, (41) 797.

Crane fly, leaf-eating, life history, (44) 653.

Crane fly, life history, (46) 460.

Craniotabes and rickets diagnosis, (43) 369.

Crank, driving or driven elements, (42) 83.

Crankshafts, torsion of, (48) 887.

Crataegomespilus, stability and heredity, (43) 818.

Crayferine, nitrifiability, (46) 516.

Cream—

- acidity, effect on loss of fat in butter-milk, (47) 79.
- amino nitrogen and ammonia in, (48) 206.
- butter fat test, factors affecting, (50) Ind. 178.
- buying, permit system, (43) Kans. 682.
- chemistry of, (46) 275.
- churning and whipping, (43) Wash. 780.
- churning, chemistry and physicochemistry of, (47) Minn. 313.
- clotted, manufacture, (45) 577.
- contests, (42) U.S.D.A. 377.
- cooling and testing, (48) 479.
- estimation of butter fat in, (45) 277.
- fat, physical condition, effect on butter, (49) 74.
- foamy, caused by lactose-fermenting yeast, (42) 774.
- for butter making, yeast and molds in, (48) 80.
- for shipment, production and care, (48) 80.
- garlic flavor in, removal, (43) 878; (48) 176.
- graded, microbial flora, (41) 375.
- hypochlorites and chloramins in, detection, (48) U.S.D.A. 12.
- imports and exports, (43) 74.
- in coffee, feathering, (50) 852.
- laws and regulations, (41) 372.
- layer, effect of pasteurization, (47) 280.
- neutralization, (45) 779, 880.
- neutralization with lime, (43) 75.
- neutralizers in, detection, (44) 12.

Cream—Continued.

- neutralizing for butter making, (50) N.Y.Cornell 76.
- odor formers during souring, (47) 784.
- of tartar from grape stems, (45) U.S.D.A. 209.
- of tartar, teaspoonful, weight, (48) 159.
- pasteurization, (46) 174; (47) 280; (49) 276, 699; (50) 878.
- pasteurization, effect on nonbacterial flora of butter, (42) 674.
- percentage of acidity neutralized, formula, (44) 13.
- preparation for market, (42) 270.
- production, best quality, (50) Ind. 179.
- quality, relation to amino and ammonia nitrogen in, (50) 476.
- remade, (42) 674.
- remade, color test for, (47) 111.
- rising power in milk of different breeds, (49) 781.
- ropy, occurrence, (44) 676.
- separation, (48) 276.
- separator, effect on bacterial count, (41) 374, 375.
- separators, mechanics of, (42) 269.
- soluble nitrogen compounds in, (50) 805.
- sour, aroma organisms in, (44) 179.
- sour, reducing acidity, (47) 784.
- test bottles, Babcock, testing accuracy, (50) 714.
- testing, (46) Calif. 578; (48) 275.
- testing, apparatus for calibrating Babcock test bottle, (44) 805.
- tests, cause of variation, (49) 475.
- tests, methods of reading, (49) 805.
- variation in fat and solids content, (44) 676.
- whipping quality, (47) U.S.D.A. 677.
- yeasts and molds in, (42) 674.

Creameries—

- bookkeeping for, (45) Iowa 778.
- cooperative, in Minnesota, (43) 75. 682.
- cooperative, in Oregon, (43) Oreg. 75.
- cooperative, methods of control, (46) 772.
- country, conditions, (47) 281.
- improving, (49) Wis. 690.
- inspection, (43) Ind. 682; (45) Ind. 778; (47) N.J. 180, Ind. 877; (48) N.J. 176; (50) N.J. 476.
- ledger accounts for, classification, (43) U.S.D.A. 878.
- sanitary conditions, studies, (44) 372; (45) 277.

Creamery—

- and tester's license law, (49) Ky. 275.
- broader field for, (42) 270.
- butter, cold storage holdings, (49) U.S.D.A. 893.
- by-products, utilization, (42) 269.
- Grove City, (46) 879.

Creamery—Continued.

- license division, report, (49) Ky. 276.
- Ind. 878.
- refuse disposal, (47) 689.
- wastes, purification, (45) 591.
- wastes, treatment and disposal, (41) 589.

Creatin—

- and creatinin in blood, (41) 13; (47) 765.
- and creatinin, reciprocal transformation, (45) 610; (48) 808; (49) 560, 613.
- and muscle tonus in man, (45) 262.
- arginin and cystin as precursors, (46) 65.
- determination, standards for, (49) 612.
- excretion in ruminants, (41) 672.
- in blood, (45) 64, 162; (49) 113..
- in blood, variability, (43) 265.
- in muscle extracts, (46) 564; (48) 361.
- in muscle tissue, (49) 613.
- ingestion, studies, (42) 367.
- oxidation by mercuric acetate, (41) 668.
- physiology, (48) 361.
- preparation from meat extract, (45) 611.
- preparation of creatinin from, (50) 308.
- rôle in protein metabolism, (45) 262.
- urinary, relation of protein intake to, (42) 367.

Creatin-creatinin—

- excretion in children, (48) 861.
- metabolism, review, (50) 162.

Creatinin—

- and creatin, reciprocal transformation. (45) 610; (48) 808; (49) 560, 613.
- determination in urine, (45) 316.
- determination method, (44) 311.
- determination, purification of picric acid for, (48) 313.
- determination, standards for, (49) 612.
- elimination as affected by work, (45) 863.
- excretion as affected by purgation, (43) 462.
- excretion of Filipinos, (41) 563.
- in blood, (45) 64, 162, 382.
- in blood, variability, (43) 265.
- in muscle extracts, (46) 564; (48) 361.
- ingestion, studies, (42) 367.
- origin in the body, (49) 560.
- physiology, (48) 361.
- preparation from creatin, (50) 308.

Creatinuria—

- in infants, studies, (42) 367.
- of man, diet and sex as factors, (46) 757.
- studies, (46) 65.

Credit unions—

- formation and supervision, (43) N.C. 490.
- negro, in the South, (43) 192.

Creek, pH values, variations, (50) 385.

Cremastini, revision, additions, (45) 459.

Cremastus facilis, notes, (47) Mass. 452.

Creonectria coccinea, notes, (44) Pa. 745.

Creonectria purpurea, notes, (41) 752.

Creontiades pallidus, studies, (50) 52.

Creosote—

effect of viscosity on penetrance in wood, (43) 283.

effect on tubercle bacillus, (44) 279.

for farm timber, method of applying, (41) 584, 585; (48) 783.

for fence posts, (42) S.C. 85; (48) Mo. 885.

for wood preservation, (47) 290, 291.

in wood-stave pipe, effect on potability of water, (42) 481.

insecticidal value for nursery stock, (49) 451.

oil as mosquito repellent, (48) 854.

oil for fence posts, specifications, (44) 87.

oil, heavy, use as wood preservative for silos, (42) Calif. 894.

penetration in coniferous woods, (41) 820.

penetration in Douglas fir, (42) 240.

penetration in lumber, formula, (45) 390.

properties and testing, (48) U.S.D.A. 207.

value for electric line poles, (49) 485.

Creosotes, low temperature, value, (50) 485.

Crepis—

capillaris—

duplicate genes in, (48) 28.

inbreeding and crossbreeding in, (46) 223.

inheritance of glandular pubescence in, (48) 28.

inheritance of morphological characters in, (50) 430.

inheritance studies, (48) Calif. 526.

spp., inheritance in, Calif. (44) 725; (47) 629.

spp., interspecific hybrids in, (46) 223, 721.

Crescograph, description and use, (41) 724.

Cresol—

determination, (46) 14.

disinfectant, new, (41) 875.

germicidal value, (47) 383.

isomeric forms, relative bactericidal powers, (45) 75.

soap solutions, cresol content, (49) 410.

solutions, saponified, new substitutes for, (45) 75.

solutions, saponified, preparation, (43) U.S.D.A. 273.

use for detecting sugar in condensed waters, (49) 408.

Cresols—

and substances for cresol soaps, (46) 374.

Cresols—Continued.

- and substitutes for cresol soaps, (42) 675; (45) 579.
- bactericidal effect on tetanus, (44) 780.
- disappearance from soils, cause, (45) 813.
- effect on tubercle bacillus, (44) 279.

Cress—

- Australian field, new weed pest, (45) Wis. 227.
- hoary, eradication, (49) 831.
- nickel and cobalt in, (49) 520.
- seedlings, growth in wind, (46) 827.
- seeds, limit of germination, (42) 39.

Crested wheat grass, culture experiments, (49) Mont. 430.

Cresylic solutions, determining strength of, (43) 614.

Cricket—*see also* Mole cricket.

- black horned tree, notes, (46) 50.
- field, control, S.Dak. (41) 251; (44) 652.
- field, life history, (47) S.Dak. 451.
- house, notes, (41) Conn.State 159.
- Mormon, control, (49) Colo. 450.
- repellents, (46) 657.
- western or Mormon, habits and control, (50) 151.

Crickets—

- control, (48) Fla. 251.
- life history, enemies, and control, (49) S.Dak. 549.
- of New England, manual, (44) 58.
- sarcophagid parasite of, (46) 458.
- tree, notes, Oreg. (44) 850; (49) 555.

Crioceris—

- asparagi, *see* Asparagus beetle.
- duodecimpunctata, notes, (47) Conn. State 156.
- subpolita, life history, (41) 853.
- viridissima n.sp., notes, (48) 654.

Crithidia in fleas, (45) 558.

Crithidia, life cycle, (41) 781.

Crocheting, energy expenditure during, (44) 66.

Crociosema plebeiana, differentiation from pink bollworm, (45) 156.

Cronartium—

- occidentale, notes, (41) 351; (43) 249; (47) 355.
- ribicola—*see also* White pine blister rust.

and Peridermium strobili, relation, (50) 150.

notes, (41) 154.

sp. in Colorado, (41) 659.

strobilinum, notes, (50) 753.

Crop—

- acreage, controlling, (49) 89.
- and business condition in Ninth Federal Reserve District, (50) 192.
- and livestock improvement, cooperative, organizing for, (42) 291.
- atlas of India, (50) 733.
- competition, (44) 197.
- cycles in United Kingdom and France, (44) 90.

Crop—Continued.

cycles in United Kingdom and United States, (41) 892.

development and production studies, (46) 28.

diseases in England and Wales, (49) 645.

distribution, treatise, (41) 730.

estimates, pre-war, in Germany, (43) U.S.D.A. 490.

forecasting in the Dakotas, (43) 491.

improvement in India, (41) 522, 529.

improvement in Scotland, (41) 636.

incomes, net, before and after the war, in France, (42) 593.

introduction tests, (43) Tex. 34.

plants, important, (41) 729.

plants, root development and absorption in, (49) 29.

preservatives, tests, (45) 536.

production—

as affected by potassium fertilizers, (50) 818.

chemistry of, (45) 114.

forecasting, (50) 692.

in Great Britain, (43) 393.

in Ohio, labor requirement, (49) 189.

in Saskatchewan, (49) 894.

manure v. fertilizers, (46) 623.

studies under dry farming, (49) Nebr. 527.

treatise, (46) 29.

prospects in Russia, (47) U.S.D.A. 797.

Protection Institute, fellowships, (46) 599.

Protection Institute, progress, (47) 847.

report of Illinois, (45) 397.

report of Michigan, (47) 493.

reports, U.S.D.A. (41) 194, 294, 492, 695, 794; (42) 89, 191, 492, 594, 896; (43) 193, 294, 491, 694, 794, 896; (44) 192, 388, 594, 693, 792; (45) 89, 294, 396, 695, 897; (46) 193, 293, 596, 789; (47) 94, 194, 395, 492, 693, 797, 895; (48) 189, 294, 390, 492, 790; (49) 90, 294, 390, 594, 693, 793, 892; (50) 92, 294, 491, 691, 894.

reports and business for 1920, (44) 389.

reports, Government, relation to marketing, (47) 895.

reports, Government, value of, (43) U.S.D.A. 794.

reports, use by farmers, (49) 90.

residue, use, (45) Mo. 24.

residue work in jars, (43) Wash. 726.

rotation, *see* Rotation.

tests, error from competition, (42) 27.

tests, replication in relation to accuracy, (50) 229.

utilization experiments, (47) U.S.D.A. 470.

valuation, feed unit system, (43) 693.

Crop—Continued.

- variation, studies, (50) 234.
- yield and weather in Scotland, (49) 115.
- yield as affected by carbon dioxid additions to soil, (50) 625.
- yield, predicting, (50) 13.
- yields—
 - and weather, correlation, (44) 414.
 - as affected by climatic conditions, (47) Minn. 115.
 - effect of fallow v. manure, (47) 25.
 - factors affecting, (45) 526.
 - from experiment fields, (47) Ill. 625.
 - increasing by seed selection, (48) N.C. 528.
 - relation to salt in soil, (47) 721.
 - relation to weather cycles, (48) 613.
 - under legume treatment, (49) 725.

Cropping—

- experiments without phosphoric acid fertilization, (50) 624.
- systems as affecting soil erosion and water absorption, (41) Mo. 622.
- systems for Red River Valley, (41) N.Dap. 822.

Crops—*see also* Field crops, Forage crops, and specific crops.

- absorption of nutrients by, (48) 18.
- and climate, relations in United States, (41) U.S.D.A. 417.
- and markets, monthly supplement, U.S.D.A. (50) 692, 894.
- and prices in Tunis, (42) 191.
- and soils, exercises in, (44) 697.
- and tillage, textbook, (46) 696.
- and weather in England, (47) 809.
- as affected by—
 - borax, (44) 516; (45) 426; (49) U.S.D.A. 324.
 - lead, (44) 819.
 - manganese, (44) 819.
 - soil and climate, (43) Idaho 227.
 - sulphur, (46) 428.
 - weather, (44) U.S.D.A. 715; (45) 16; (48) U.S.D.A. 713.
 - weather in New Jersey, (42) 116.
 - weather in Sweden, (42) 117.
 - weather, treatise, (44) 507.
- calcium content, factors affecting, (48) 721.
- composition as affected by soils and fertilizers, (41) 422, 813.
- cost of production, (47) Mo. 192; (48) N.Dak. 293.
- cost of production in Scotland, (50) 191.
- damage by weather, (44) U.S.D.A. 118.
- disease resistant varieties, development, (50) Minn. 143.
- early spring sown, (48) West.Wash. 498.

Crops—Continued.

- effect of acid and alkaline fertilization on growth, (48) 424.
- effect on each other, (44) R.I. 31, R.I. 33; (45) N.Dak. 226, 340; (47) R.I. 736; (50) 532.
- effects on following crops, (41) R.I. 135.
- emergency, after rice failure, tests, (50) 28.
- experiments in Travancore, (50) 231.
- fertilizer requirements, (48) Mass. 620.
- forecasting from weather, (47) 209.
- growth, relation to alkali content of soils, (49) 513.
- growth, relation to soil microorganisms, (49) 514.
- growth, relation to soil reaction, (49) 619.
- growth response to fertilizers, (47) 22.
- hail insurance for, (44) U.S.D.A. 291.
- improvement by breeding, (50) 828.
- improvement by selection, (45) 228.
- improvement in Bengal, (50) 828.
- in Wisconsin, cost of production, (46) 389.
- intertillage, effect on nitrate formation, (47) 214.
- irrigated, growing, (47) Oreg. 886.
- irrigated, use by livestock, (42) U.S.D.A. 370.
- irrigation experiments, (43) 387.
- labor requirements, (47) Ark. 795.
- lime requirement, (47) 27.
- nitrogen content, effect of fallow v. manure, (47) 25.
- nitrogen removal by, (47) Tex. 22.
- of South, insects affecting, (48) 152.
- outline for seasonal instruction, (42) 795.
- periodicity in, (43) 416.
- planting and seeding, (45) Can. 824.
- quality, effect of soil conditions, (49) Mich. 419.
- quality, relation to soil fertility, (46) 623.
- relative productive capacity, (48) 731.
- relative resistance to alkali, (42) Utah 28.
- root development, (45) 732.
- science of, lessons, (44) 194.
- scoring exhibits in, (50) 195.
- self-fertilized, genetic basis for improvement, (46) 437.
- size as affecting experimental results, (44) 521.
- time of planting, application of bioclimatic law, (43) U.S.D.A. 509.
- time to sell, (46) Mich. 598.
- v. pasture, relative labor income, (43) 92.
- water requirements, (45) Nebr. 531; (50) 733, 828.
- Cross sections, sloping, factors for cubic yards, (41) 582.
- Crossbreeding and inbreeding, (47) 325.

- Crossing, effect on evolution of races, (49) 821.
- Crossing-over—
 effect of affinity between genes, (50) 730.
 in X chromosome, effect of X-rays, (50) 529.
 ratios, computing, (50) 129.
 studies, (45) 370.
- Crossties, zinc-treated, durability, (41) 690.
- Crotalaria—
 juncea as cover crop, (48) P.R. 226.
 seed, composition, (48) 68.
 species, comparison, (50) P.R. 533.
 usaramoensis as fiber plant, (41) 640.
- Crotalariaeosis equorum, paper on, (44) 76.
- α -Crotonic acid as affected by phosphates, (43) 131.
- Crowberry, adulterant for marmalades, (42) 415.
- Crown gall—
 behavior on rubber, (48) 747.
 disease, studies, (49) Wis. 645.
 effect on plants, (45) Wash. 747.
 in South Africa, (47) 45.
 inoculations on Bryophyllum, (45) 647.
 isolation of organism from, (47) 548.
 malignancy and analogy to cancer, (42) 841.
 notes, (42) 742; (49) Oreg. 546.
 on apple grafts, control, (47) Iowa 354.
 on beets, studies, (48) 843.
 on rubber tree, behavior, (46) 49.
 organism, relation to host tissue, (50) 42, 745.
 protection against, (47) Mich. 441.
 resistant stock, studies, (47) Calif. 649.
 review of investigations, (41) 450.
 studies, (41) 152; (50) 745.
- Crown rust—
 alternate hosts and biologic specialization, (47) Iowa 542.
 dissemination by Rhamnus, (50) U.S.D.A. 43.
- Crows—
 control, Okla. (42) 355; (43) 51.
 popular account, (43) 50.
 relation to agriculture, (44) U.S.D.A. 249.
 status and control, (45) Mich. 452.
 stomach contents, (47) 531.
- Crucifer—
 clubroot, control, (45) 50.
 clubroot, notes, (47) 44; (49) 44.
 diseases, notes, (41) 745; (45) 842.
 finger-and-toe, (43) 546.
 hybrid, nodosities on roots, (49) 820.
 oil-crop pests, control, (49) 252.
 seedlings, failure of, (42) 46.
 white rust, notes, (48) 741.
- Cruciferae—
 as affected by sulphur, (45) 26.
 important for food and fodder, (41) 729.
- Crucifers—
 culture and use in Australia, (47) 227.
 insects affecting, (44) 57.
 Mendelian characters, (44) 428.
- Crude fiber, *see* Cellulose.
- Crustacea muscle, composition, (43) 568.
- Cryphalus abietis, studies, (42) 158.
- Cryptocleptes n.g., description, (46) Miss. 461.
- Cryptococci in digestive tube of lymphangitic horse, (46) 83.
- Cryptococcus farciminosus, action of disinfectants on, (48) 675.
- Cryptohelcostizus rufigaster n.g. and n.sp., description, (42) 655.
- Cryptohelcostizus rufigaster n.g. and n.sp., notes, (44) 554.
- Cryptolaemus montrouzieri—
 introduction into France, (45) 559.
 notes, (43) 660; (47) U.S.D.A. 159.
- Cryptomeigenia spp., parasites of white grubs, (42) 550.
- Cryptomeria japonica, darkening of heartwood, (46) 644.
- Cryptorhynchus mangiferae, notes, (44) Hawaii 60.
- Cryptorhynchus spp., notes, (42) 159.
- Cryptoripersia arizonensis, synonymy, (41) 757.
- Cryptostoctis sp., description, (45) 547.
- Cryptotermes—
 brevis, notes, (46) 559.
 new species, (43) 256.
 sp., affecting lumber, (48) V.I. 354.
- Cryptothrips—
 floridensis, *see* Camphor thrips.
 laureli, life history, (47) 758.
- Cryptus retentor, notes, (50) U.S.D.A. 258.
- Crystallography in measurement of morphine and its derivatives, (41) 801.
- Ctenocephalus—
 canis parasite, studies, (41) 781.
 felis, transmission of surra by, (49) 158.
 spp., notes, (50) 55.
 spp., parasite of, (45) 80.
- Ctenucha virginica, studies, (47) Me. 161.
- Cubeb substitutes, (46) 755.
- Cucumber—
 angular leaf spot, (44) Conn.State. 150.
 anthracnose under glass, control, (49) 146.
 aphids, control, (45) Mich. 258.
 bacterial spot, control, (48) U.S.D.A. 46.
 bacterial wilt, control, (43) U.S.D.A. 245.
 beetle, striped—
 color markings and powers of flight, (49) 854.
 control, (43) Mo. 757; (45) Ohio 459; (47) Ind. 156, U.S.D.A. 555; (49) U.S.D.A. 454, Wis. 653, Wis. 760.
 in South Dakota, (43) 850.

Cucumber—Continued.

- beetle, striped—continued.
 - infection with wilt organisms, (42) 855.
 - notes, (41) Conn.State 158, U.S.D.A. 259, 450.
 - paper on, (49) Mich. 495.
 - parasite of, (47) 260.
- beetles—
 - control, (48) U.S.D.A. 457.
 - distance of flight, (47) Wis. 452.
 - nicotin sulphate dust for, (44) U.S.D.A. 652.
 - parasite of, (46) 461.
 - studies, (43) U.S.D.A. 245; (50) N.Y.State. 555.
 - western, control, (46) 856.
- black rot, notes, (50) 651.
- disease, new, (47) 543.
- diseases, notes, (41) 450, 745; (43) 151.
- downy mildew, control, (50) S.C. 648.
- downy mildew, notes, (48) Mass. 643.
- flea-beetle, notes, (41) Conn.State 159.
- fruit spot, (46) 449.
- gummosis, (46) 544.
- leaf spot, notes, (46) 447; (50) 547.
- mildew, control, (42) Guam 38.
- mosaic—
 - effect of temperature, (47) 349.
 - notes, (45) 541; (49) Iowa 746; (50) 547.
 - overwintering, (49) Wis. 644.
 - relation to pickling, (47) 247.
 - studies, (45) Wis. 244, 846.
 - transmission to other hosts, (49) 646.
 - "white pickle," occurrence, (42) Mass. 349.
- pickles, preparation, (44) U.S.D.A. 557.
- root gall, notes, (45) 842.
- Sclerotium disease, (46) 543.
- seed, relation of age to productivity, (46) 640.
- skin, vitamin A in, (49) 769.
- verticilliose, studies, (41) 450, 843.
- wilt, cause, (49) 648.
- wilt, notes, (42) 47; (46) 447.

Cucumbers—

- analyses, (43) 63.
- as greenhouse crop, (44) Oreg. 834.
- breeding experiments, (44) 533, Minn. 739.
- cost of production, (45) Ohio 134.
- cost of production in Colorado, (44) U.S.D.A. 789.
- culture, (49) Mont. 136.
- culture experiments, (41) 339, V.I. 340.
- digestibility in stomach, (42) 862.
- dusting experiments, (47) Va.Truck 236.
- effect of—
 - alkalinity, (48) Calif. 524.
 - ammonium nitrate, (47) 637.
 - carbon dioxid, (44) 218; (45) 345, 834.

Cucumbers—Continued.

- effect of—continued.
 - limestone, (50) 300.
 - soil disinfection, (42) 718.
- fertilizer experiments, (45) 538; (49) Ohio 337.
- forcing with neon light, (46) 640.
- greenhouse, culture, (45) 537, 538.
- in glasshouses, mycetophilid flies attacking, (49) 254.
- insects affecting, (42) Conn.State 648.
- pollination experiments, (48) 443.
- production in greenhouses, (49) U.S.D.A. 436.
- propagating in peat pots, (44) 40.
- sodium for, (41) R.I. 426.
- soil sterilization experiments, (49) 741.
- spray residue on, (47) U.S.D.A. 360.
- spraying and dusting experiments, (49) Va.Truck 233.
- storage rots, (41) Minn. 745.
- varieties, (48) Can. 38.
- varieties, susceptibility to wilt, (50) 748.
- variety, new, (48) 443.
- variety tests, (42) Minn. 835; (47) Miss. 831.
- vitamin B content, (44) 261.
- white grubs on, control, (45) 258.
- wild, rôle in cucurbit mosaic transmission, (43) 654; (44) U.S.D.A. 344.
- yield as affected by irrigation, (50) Mo. 15.

Cucurbit—

- bacterial wilt. (43) U.S.D.A. 245.
- bacterial wilt, insect transmission, (45) 543.
- diseases, (43) Ind. 345; (45) 649; (46) Del. 646; (48) Del. 642.
- Fusarium diseases, studies, (41) Minn. 745.
- Fusarium wilt, studies, (43) Tex. 846.
- mosaic, cross-inoculation studies, (49) 646.
- mosaic disease, cause, (44) U.S.D.A. 344.
- mosaic, notes, (50) 651.
- mosaic, transmission, (43) 654.
- pollen germination, (49) Iowa 731.
- powdery mildew, notes, (45) 842.
- seeds, effect on animal metabolism. (45) 671.

Cucurbita. variations in, (45) 427.

Cucurbitaceae, treatise, (50) 727.

Cucurbits—

- effect on following crop, (49) 231.
- grafting experiments, (48) 127.
- insects affecting, (44) 57.
- pollination studies, (47) Iowa 741.

Cudrania triloba, characters and uses, (44) 238.

Culex—see also Mosquitoes.

- aegypti, notes, (46) 661.
- fatigans, infection with *Filaria bancrofti*, (44) 656.
- larvae, new, (42) 652.

Culex—Continued.

quinquefasciatus, notes, (45) V.I. 150;
(46) P.R. 157; (49) 657.

spp. as affected by hydrocyanic acid,
(44) 354.

subgenera, notes, (43) 258.

Culicid larvae as affected by chemicals,
(47) 357.

Culicid larvae, new, from Transvaal, (41)
874.

Culicidae—*see also* Mosquitoes.

classification, evolution of, (49) 400.
of Australia, habits and distribution,
(48) 254.

oviposition in, (47) 357.

Culicifuges, tests, (41) 554.

Culicoides oxystoma, life history, (47) 358.

Culicoides, relation to horse sickness, (41)
879.

Cultivation—

by electric tractor, (50) 388.

clean, in relation to insect control,
(41) 456.

effect on nitrate production in soil,
(41) Mo. 623; (47) 214.

effect on organic phosphorus in soil,
(45) Ohio 118.

effect on rainfall, (42) U.S.D.A. 617.

effect on soil erosion and water ab-
sorption, (41) Mo. 622.

effect on soil moisture, (43) 210.

effect on soil moisture and nitrate for-
mation, (47) Ark. 724.

for weed control, (41) 737.

in relation to soil moisture content,
(41) 129.

intensity of, (48) 388.

Jean method, results, (49) 812.

mechanical—

in France, (42) 588, 785; (47)
297.

in Java, (44) 383.

in Trinidad, (44) 383.

in Tunis, (42) 390.

of rice in China, (43) 484.

outfits, (48) 684.

soil grip attachments, (42) 488.

motor, apparatus for in France, (43)
289.

of soils in Java, (48) 684.

Cultivator, pulverizing rotary as substitute
for plow, (49) 86.

Cultivators—

mechanical, (43) 892.

motor, construction and operation,
(42) 588.

motor, directory, (44) 887.

motor, in Europe, (46) 890.

6-shovel, draft of, (43) Mo. 787.

tests, (49) 486.

Widen type, description, (42) 488.

Culture media—*see also* Nutrient media.

absorption-transpiration ratio, (44)
323.

acidity, determination by Fuller's scale,
(46) 724.

Culture media—Continued.

adjustment of pH value, (42) 72;
(50) 411.

alkalinity, (47) 502.

autolyzed yeast in, (41) 83.

beef extract, preparation, (41) 781.

broth, changes in H-ion concentration,
(45) 503.

buffer index, pH and titration determi-
nations, (46) 708.

change in pH during heating, (46)
413.

changes in reaction due to actinomy-
cetes, (43) 635.

composition, relation to vitamin con-
tent of organisms, (47) 167.

containing acids and buffers, indica-
tors for, (48) 203.

containing plant tissue, effect on bac-
teria, (47) 425.

desiccated, preparation, (47) 204; (50)
281.

diagnostic, for paratyphoid-enteritidis
group, (42) 882.

dry yeast extracts for, (42) 708.

for isolation of sulphur bacteria, (47)
621.

for mallein formation, (44) 478.

for pneumococci, (41) 778.

for study of lactobacillus, (47) 583.

for testing disinfectants, (43) 181.

for vaccine organisms, (41) 680; (44)
577.

for yeast growth, (47) 266, 366.

from bouillon cubes, (43) 329.

from fish, (43) 580.

from germ-free filtrates, (44) 181.

H-ion concentrations, regulating, (44)
410.

liquid, for wood-destroying fungi, (42)
225.

liver, and spleen for Bacterium abortus,
(44) Mich. 878.

milk-powder agar, (44) 575.

pH values v. titratable acidity in, (50)
802.

preparation, directions, (43) 11.

reaction, determination, (45) 205.

reaction, effect of plant, (50) Calif.
821.

reaction, relation to optimum tempera-
ture, (47) 127.

reactions, (43) 10, 329.

semiliquid, for anaerobic organisms,
(42) 379, 775.

simplified, preparation, (45) 278.

solid, (45) 610.

soy bean cake for, (42) 334.

sterile, device for growing large plants
in, (46) 124.

titration, (46) Mich. 413.

unheated egg yolk, (41) 63.

use in characterizing Actinomycetes,
(46) N.Y.State 317.

use of nitrogenous compounds in,
(41) 264.

Culture media—Continued.

- use of washed agar in, (44) 575.
- variations in H-ion concentration, (43) 381.

with wide pH range, (46) N.C. 740.

Cultures, bacterial, H-ion concentration, (41) 410, 503.

Culverts—

- determining sizes, (41) U.S.D.A. 381.
- metal, galvanizing, tests, (43) U.S.D.A. 690.
- reinforced concrete, specifications, (42) 579.

Cuminum cimum, spraying experiment, (48) 145.

Cupferron—

- preparation of, (44) 112.
- use in quantitative analysis, (42) 802.

Cuprammonium—

- sulphate, adhesiveness, (43) N.H. 842.
- washes, studies, (42) 350; (43) N.H. 44.

Cupressus—

lawsoniana, value as shelter-belt tree, (49) 240.

seedlings, dying-off disease, (46) 544.

spp., disease affecting, (43) 156.

Cuprous copper, determination in paint, (41) 314.

"Cupu" seeds, analyses, (46) 108.

Cupuassu fat, digestibility, (42) 552.

Curbs, concrete, construction, (43) 90.

Curello, control, (45) 137.

Curellionidae of Cholina group, (41) 556.

Curellionoidea, notes, (41) 261.

Curellios of walnut and hickory, (47) U.S.D.A. 556.

Curdalac as rennet substitute in cheese making, (42) Calif. 876.

Curly dwarf, (46) Can. 145.

Curly leaf symptoms, practical use, (45) 749.

Currant—

anthracnose, control, (46) 844; (49) Oreg. 547.

anthracnose, notes, (44) 48, Mich. 144.

aphid, antennal variation in, (44) 754.

aphid, control, (47) 52.

aphid, notes, (47) 748; (49) Oreg. 555; (50) N.Y.State 555.

aphid, red, production of winged forms, (46) 154.

aphid, red, studies, (41) 756.

aphids, life history and control, (44) U.S.D.A. 59.

big bud, notes, (42) 151.

black, leaf spot, notes, (44) 48.

black, rust, notes, (41) 154; (44) 48.

borer, notes, (47) 748; (49) Oreg. 555.

borer, studies, (41) 667.

Botrytis disease, (45) 843.

die-back, control, (49) Oreg. 547.

die-back, notes, (45) 147.

diseases and pests, (45) Mo. 238, 551.

Currant—Continued.

diseases, control, (43) Wash. 349, Ill. 847.

diseases, notes, (42) N.Y.State 350 748; (46) 243, 646.

fruit fly, notes, (49) Oreg. 555.

industry in California, (42) 42.

industry in California, history, (43) 837.

leaf spot, notes, (42) N.Y. State 350.

lice in South Dakota, (43) 850.

mite, black, effect of sulphur on, (41) 660.

powdery mildew, control, (49) Oreg. 547.

root rot, notes, (42) N.Y. State 350.

roots, resistance to freezing, (41) N.Y.Cornell 821.

rust in British Columbia, (49) 150.

rust, notes, (46) 844.

rust, prevention, (42) 643.

sap, freezing-point depression, (44) N.Y.Cornell 821.

shoots, hardness, relation to pentosan content, (46) 443.

silver-leaf, notes, (49) 845.

stem girdler, notes, (45) Conn.State 149.

sunburn, notes, (46) 447.

worm, imported, notes, (42) 748.

worms in South Dakota, (43) 850.

worms, notes, (49) Oreg. 555.

Currants—

American gooseberry mildew in, varietal resistance, (47) 546.

black—

blister rust affecting, (43) 249.

cause of premature dropping, (45) 539.

classification, (43) 438.

detecting reversion, (46) 39.

resistance to big bud, (41) 241 836; (42) 150.

reversion, (41) 241, 836, 841. (42) 150; (43) 448.

reverted, leaf character in, (49) 649.

ringing experiments, (49) 40.

breeding experiments, (43) 742; (44) 145; (46) 39.

canned juices, for jelly making, (47) Calif. 614.

Cronartium ribicola overwintering on, (43) 849.

culture. (41) Mich. 148; (43) Nebr. 644; (44) Mont. 337, Alaska 532; (47) Minn. 338, Wis. 438, Alaska 534; (48) Minn. 338; (49) Mont. 136.

culture and marketing, (43) 40.

culture and propagation, (45) Mo. 238.

culture and quarantine regulations. (41) U.S.D.A. 45.

culture at high altitudes, (44) Colo. 235.

Currants—Continued.

- culture experiments, (44) Alaska 336; (48) Can. 450; (49) Alaska 435.
- culture in California, (43) U.S.D.A. 837.
- culture in Minnesota, (41) Minn. 387.
- description and yield, (48) Can. 38.
- eradication by chemicals, (43) 246, 248.
- fertilizer experiments, (45) 641; (47) 343.
- hardiness studies, (45) N.Dak. 236.
- identity of *Cronartium* on, (47) 355.
- insects affecting, (42) 748; (43) Wash. 349; (44) Mo. 754; (46) 243; (49) Oreg. 555.
- Nectria cinnabarina* affecting, (49) 649.
- potash fertilizers for, (41) Mass. 21.
- pot-grown, fertilizer experiments, (49) 833.
- preserving, (45) 665.
- pruning, (45) 44; (48) Mich. 342.
- root and top growth, (47) 343.
- spray schedule, (44) Mo. 535.
- spraying, (50) 346.
- spraying and dusting, (44) Mich. 144.
- storage studies, (44) Calif. 738; (46) 338.
- storage temperature, (47) Calif. 640.
- sugar in, effect of fertilizers, (47) 343.
- time of fruit bud differentiation, (49) 834.
- varieties, (48) N.Dak. 235.
- varieties for Missouri, (44) Mo. 536.
- varieties, new, (43) 438.
- variety tests, (41) 445; (42) Minn. 834.
- wild, of North Dakota, (41) 836.
- Curuba, culture directions, (45) 35.
- Curuba, notes, (48) 738.
- Cuscuta—*see also* Dodder.
 - control, (44) 833.
 - epilinum, notes, (48) 47.
 - epilinum on flax, (46) 743.
 - parasitism by, (46) 343.
 - seed, devitalization, (41) 646.
- Custard apples—
 - chalcid affecting, (50) 58.
 - culture, (45) 44.
- Cutaneous hypersensitiveness, studies, (42) 74.
- Cuterebra larvae from cats, (46) 686.
- Cuterebra tenebrosa, studies, (41) 258.
- Cutin and suberin in plants, (46) 631.
- Cut-over land—
 - clearing, (47) Ala.Col. 887.
 - cost of stumping, (48) Ga.Coastal Plain 682.
 - for pastures, (44) Wash. 33.
 - in United States, (41) U.S.D.A. 693.
 - management, (47) Mich. 188.
 - pasture, (41) Minn. 387.
 - second growth on, (49) Minn. 439.
- Cut-over lands—
 - development, (45) Wis. 497.

Cut-over lands—Continued.

- of Michigan, classification, (46) 42.
- of Minnesota, development, (45) 796.
- program for reforestation, (43) 343.
- redwood, agriculture in, (49) Calif. 90.
- Cuttings, propagation in acidic media, (49) 835.
- Cutworm—
 - army, control, (46) 153.
 - baits, (47) Minn. 356, 757.
 - black, affecting tobacco, (43) 52.
 - black, control, (41) 62; (45) 657.
 - black, notes, (49) 758.
 - black, parasite of, (44) 550; (47) 357.
 - devastation in Canada and date of re seeding, (42) 545.
 - pale western—
 - control, (46) 153; (49) Mont. 152, Mont. 251.
 - distribution, (50) 846.
 - forecasting outbreaks, (49) 155, 759.
 - meteorological relations, (49) Minn. 759.
 - notes, (43) Mont. 758; (44) Mont. 348, Mont. 757; (45) Mont. 359; (48) U.S.D.A. 52; (50) 151.
 - parasites of, (46) 247.
 - poisoning, (47) 851.
 - summary, (46) 352.
 - septicemia, notes, (50) 846.
 - variegated, life history, (46) 660.
 - variegated, notes, (44) Iowa 452; (45) 550.
- Cutworms—
 - affecting cotton, (49) 758.
 - control, (44) 653; (49) Mont. 152.
 - control by poisoned bait, (41) 251, 754; (50) 53.
 - in Rhodesia, remedies, (41) 62.
 - notes, (41) Mont. 57; (49) N.Mex. 554.
 - of Minnesota, key, (43) 55.
 - on corn in New South Wales, (41) 57.
 - on cotton, (43) U.S.D.A. 352.
 - on rice, (46) 458.
 - studies, (50) Mont. 155.
- Cyanamid—
 - decomposition in soil, mechanism, (44) 216.
 - determination, (43) 804; (49) 505.
 - dicyandiamid determination in, (44) 711.
 - effect on corn growth, (42) 429.
 - fertilizing value, (41) 815, 816; (42) 721; (45) Miss. 129, 518, 519; (50) U.S.D.A. 621.
 - for weed control, (41) 737.
 - hydrolysis products, (50) 9.
 - in fertilizers, (46) 717.
 - in soil, behavior, (50) U.S.D.A. 622.
 - mixed with fertilizer materials, changes in, (44) 421.
 - nitrogen availability in, (47) Tex. 217.

- Cyanamid—Continued.
 reactions in mixed fertilizers, (44) 514.
 transformation into ammonium sulphate, (42) 623.
 transformation into urea, (42) 428.
 treatment for root knot, (41) Fla. 548.
- Cyanic acid, formation and identification, (42) 414.
- Cyanid—
 as soil insecticide, (44) 852.
 as source of nitrogen, (44) 216.
 for gopher control, (46) 455.
 gas, adsorption by foods, (45) 62.
 injection, effects, (48) 557.
 of mercury, value as disinfectant for blight control, (44) Oreg. 848.
 production and sale in 1919, (44) 513.
 reactions, sensitiveness of, (42) 206.
 synthesis for nitrogenous fertilizers (42) 722.
- Cyanized briquets, ammonia production from, (43) 220.
- Cyanocitta cristata, geographic races, (44) 849.
- Cyanogen chlorid, insecticidal value, (44) U.S.D.A. 56.
- Cyanogen compounds, estimation in concentrated ammonia liquor, (41) 113; (42) 206.
- Cyanophyceae, coloration, effect of colored lights on, (43) 526.
- Cyarda sp., notes, (49) 550.
- Cyathea, parasite on, (42) 151.
- Cyclamen, aerial fertilization with carbon dioxide, (41) Vt. 833.
- Cyclamen, fertilizer experiments, (47) Calif. 642.
- Cycloconium oleaginum—
 lime-sulphur for, (43) 346.
 on olives, (42) 645.
- Cyclone—
 cloud cross-section of, (43) U.S.D.A. 119.
 of mid-February, 1919, (44) U.S.D.A. 416.
- Cyclones, dynamics of, (50) 414.
- Cylas formicarius, *see* Sweet potato weevil.
- Cylicostomum—
 adersi n.sp., studies, (42) 776.
 in horses, (49) 256.
 pateratum n.sp., description, (41) 685.
 pseudo-catinatum n.sp., description, (41) 87.
 spp., studies, (42) 776.
 tridentatum n.sp., notes, (44) 583.
 triramose n.sp., notes, (44) 583.
- Cylindrocladium scoparium, notes, (48) 248.
- Cylindrocopterus adpersus, notes, (50) 151.
- Cylindropharynx rhodesiensis n.sp., notes, (44) 583.
- Cylindrosporium—
 juglandis, notes, (49) N.C., 747.
 padi, treatment, (41) U.S.D.A. 349.
 pomi, notes, (44) Pa. 745.
- Cylindrotoma splendens, life history, (44) 653.
- Cyllene—
 caryae, summary, (46) N.Y. Cornell 249.
 robiniae, *see* Locust borer.
 spp., notes, (45) U.S.D.A. 258.
- Cymatophora—
 ribearia, notes, (42) 748.
 sulphurea on cranberries, Mass. (46) 52; (47) 452.
- Cymbopogon spp. for paper making, (42) 531.
- p-Cymene—
 as a solvent, (44) 310.
 synthesis of thymol from, (44) 10.
- Cynipidae—
 American, (45) 860; (48) 59.
 California gall-making, descriptions, (48) 556.
 descriptions, (48) 256.
 parasites of flies, (42) 361.
 parasitic, descriptions of genotypes, (46) 58.
- Cynodon dactylon affected by Balansia, (43) 152.
- Cyornis, new subspecies, (44) 849.
- Cyperus—
 esculentus tubers, analyses, (50) 408.
 rotundus, eradication, (50) 238.
 spp. for paper making, (42) 531.
- Cyphella—
 heveae, notes, (48) 45.
 heveae on rubber, (45) 148.
 marginata on peach and almond, (48) 146.
- Cypress—
 bald, cause of brashness, (45) 46.
 bark scale, studies, (43) U.S.D.A. 452.
 lath subirrigation plan, (41) 482.
- Cyrtacanthacris guttulosa, notes, (43) 52.
- Cyrtidae from South America, new genus erection, (42) 157.
- Cyrtobasis, new genus, description, (41) 261.
- Cyrtorhinus mundulus—
 attacking sugar cane leafhopper, (44) 550.
 notes, (45) 551; (47) 253.
- Cystein—
 determination in proteins, (49) 503.
 derivatives of, (49) 501.
 so-called auto-oxidation, (50) 613.
- Cysticercus fasciolaris, biology of, (49) 76.
- Cysticercus spp., in frozen meat, (50) 582.
- Cysticercus tenuicollis, studies, (50) 880.
- Cystin—
 as affected by hydrolysis, (47) 310.
 as growth-limiting factor of velvet bean, (47) 365.
 content of proteins, relation to their efficiency, (43) 663.
 derivatives of, (49) 501.
 determination, (43) 505.
 determination in albumin, (49) 503.
 determination in proteins, (47) 504.
 determination in urine, (48) 505.

Cystin—Continued.

- effect on starch hydrolysis, (46) 708.
- metabolism, cystein as intermediary product, (48) 464.
- oxidation in animal organism, (47) 167.
- rôle in dietary properties of proteins, (48) 67.
- rôle in nutrition, (42) 756.

Cystolithiasis among Filipinos, (42) 462.

Cystopus—

- vlti on sugar beets, (46) 450.
- candidus, infection studies, (47) 45.
- candidus, notes, (47) 839; (48) 741.

Cystospora batata—

- control, (47) N.J. 448.
- notes, (46) 551; (48) Del. 642.

Cytase in pollen, (48) 728.

Cytology—

- dictionary of scientific terms, (45) 299.
- Doncaster's contribution to, (45) 369.
- of *Tilletia tritici*, (47) 222.
- treatise, (44) 66; (46) 823.

Cytolysins, studies, (41) 861; (44) 566.

Cytoplasm, morphological constitution, (47) 126.

Cytospora—

- cause of apple canker, (41) Ill. 156; (48) 146.
- chrysosperma in Northwest, (46) 850.
- chrysosperma, notes, (43) Ariz. 749; (45) 46; (47) 355, Ariz. 755.
- nicotianae, notes, (50) 248.
- palmicola, notes, (47) 547.
- sacchari, notes, (50) 244.
- sp. on rubber, (43) 45.

Cytosporina—

- citriperda n.sp., description, (49) 150.
- ribis, notes, (45) 147.

Czechoslovakia, in world production, (47) 395.

Dacnusa—

- areolaris, larval development, (47) 762.
- iridicola n.sp., description, (41) 63.

Dactylis glomerata, *see* Orchard grass.

Dactylopius vitis, notes, (47) 551.

Dacus—

- ferrugineus, synonymy, (42) 653.
- n.spp., descriptions, (42) 653.
- oleae, control, (48) 157.
- sensu latiore, description, (43) 56.

Daedalea—

- confragosa, enzym action in, (44) 27.
- spp., studies, (44) 27.

Daffodil, new, production in marine climate, (46) 720.

Daffodils, seedlings, notes, (43) 240.

Dahlia—

- hopperburn, notes, (41) 848.
- leaf spot, (47) 839.
- n.spp., description, (42) 641.
- tree, of Guatemala, (45) 347, 524.
- tubers, analyses, (47) Conn.State 559.

Dahlias—

- bud variation, (42) 141.
- culture, (50) N.J. 39, U.S.D.A. 239.

Dahlias—Continued.

- culture and varieties, (41) 242.
- discovery of ancestral form, (49) 141.
- for Mississippi, (44) 147.
- in Australia, (47) 835.
- inulin in, (42) 226.
- suggested revision of genus, (42) 641.
- treatise, (47) 41.
- variety tests, (46) 839.

Dairies—

- regulation of boiler feed water in, (45) 83.
- regulations governing in England, (50) 279.
- scoring, (41) 573.

Dairy—

- bacteria, controlling, (49) 599.
- bacteriology, cooperative laboratory for, (43) 879.
- bacteriology, treatise, (45) 880.
- barn loft floor, concrete, (44) 486.
- barns—
 - climatic, (44) 688.
 - construction, (45) Wis. 84; (50) U.S.D.A. 190.
 - construction and equipment, (42) Nebr. 285.
 - design, (50) 388.
 - diagrams, (49) 175.
 - plans, (48) 386.
 - regulations governing in England, (50) 279.
 - ventilation, (43) 892.
- breeds, milk and fat yields, (50) 676.
- buildings, plans, (43) 592.
- buildings, relation to sanitation, (46) 174.
- by-products and residues as food, (47) 612.
- by-products, feeding value, (47) 278, Ark. 776.
- by-products, utilization, (41) 80.
- cattle, *see* Cattle, Cows, *etc.*
- chemistry, colloid problems, (41) 801.
- chemistry, notes, (49) 376.
- chemistry, treatise, (46) 113.
- Congress, World's, (46) 400; (48) 398; (49) 277, 601.
- control, (49) 276.
- control and cost accounting groups, (48) 687.
- education in Belgium, (48) 794.
- exhibit, (43) Mich. 698.
- exhibit, preparation, (44) 795.
- farm inspection, (46) 174.
- farm organization, Wash.Col. (48) 591; (49) 291.
- farm survey, (50) 592.
- farm survey in British Columbia, (46) 90, 679.
- farming—
 - alpine, decline, (43) 576.
 - bibliography, (43) 73.
 - capital required, (43) 94.
 - effect of milk recording societies, (46) 679.

Dairy—Continued.

farming—continued.

- in Barron Co., Wisconsin, (41) 676.
- in Great Britain, (45) 380.
- in India, (42) 563.
- in Kansas, Kans. (43) 576; (45) 678.
- in Missouri, (41) Mo. 694.
- in New Jersey, (42) 290.
- in New York, (50) N.Y.Cornell 89.
- in northwestern Arkansas, (41) 182.
- in Ontario, (42) 688.
- in Pennsylvania, (42) Pa. 170.
- in Switzerland, (43) 779.
- in timbered section, (41) Minn. 386.
- in Victoria, (43) 177.
- manual, (49) 778.
- principles, (48) 875.
- projects, handbook, (50) 94.
- treatise, (42) 263; (50) 676.

farms—

- business analysis, (49) Idaho 88.
- forage crops on, (43) 177.
- inspecting, (49) U.S.D.A. 878.
- labor income, (43) W.Va. 92.
- manure management, (48) Ill. 21.
- organization, (47) Wash.Col. 594.
- renting, (48) U.S.D.A. 293.
- share leases for, (42) 689.
- soil fertility maintenance, (43) 23.
- use of fertilizers, (47) Wis. 320.
- feeds, analyses, (46) Mich. 168.
- feeds, composition and retail price, (47) Conn.State 570.
- heifers, cost of raising, (50) Can. 676.

herd—

- college, (45) Mich. 698.
- competition at Salisbury, (47) 380.
- disease records, (41) 86.
- improvement, (42) Nebr. 70.
- management at Naval Academy, (45) U.S.D.A. 777.
- purebred, development and management, (47) Mont. 675.
- records, (41) N.Y.Cornell 180; (43) N.Y.Cornell 469, Pa. 576. Minn. 876; (46) 878; (48) 478.
- records, analysis, (47) Mich. 675.
- records, value of 7-day tests, (42) 564.
- records, yearly tests, (42) Mich. 397.
- sires, (46) Wash. 297.
- testing in Tasmania, (47) 380.
- testing rules and conditions, (48) 274.

herds—

- accredited, and practicing veterinarian, (47) 283.
- accredited, list, (44) 683.
- accredited, testing, (43) 683.
- advanced-registry tests, (45) Ind. 577.

Dairy—Continued.

herds—continued.

- college, class leaders in, (48) 772.
- costs and returns, (47) N.Y.Cornell 578.
- improving, disposal of cull animals, (48) 875.
- standard test, (47) 280.
- testing, (46) 771.
- houses, plans and construction, (46) U.S.D.A. 288.
- husbandry in high schools, (41) 97.
- industry—see also Dairying.
 - in Italy, milk powder for, (44) 274.
 - world's principal events, (49) 675.
- inspection, (41) 372, 573, 775, 776, Ind. 777; (45) Ind. 778.
- inspection—
 - cooperation in, (47) 280.
 - instructions for, (42) 378.
 - law, (44) N.J. 474.
 - system, (50) 876.
- institute in Italy, (47) 195.
- laboratory manual, (46) 295; (50) 195.
- laws of California, (44) 75; (45) 174.
- management, usefulness of production records, (42) Ohio 899.
- manufactures courses in agricultural colleges, (44) 794.
- manufacturing plant, construction, (48) 578.
- manufacturing plants in Michigan, list, (49) 879.
- marketing, (41) 183, 184.
- plants, cooperative, in Belgium, (43) 878.
- plants, management, (44) 778.
- plants, milk control in, (46) 75.
- power and heat for, in Germany, (49) 84, 85.
- production in Ohio, cost, (41) Ohio 274.
- production of South Australia, (45) 173.
- production, records, (42) Mich. 397.
- products—
 - advertising methods, (43) U.S.D.A. 580.
 - analysis, official method, (44) 9.
 - bacterial analysis, (41) 372, 373.
 - bacteriological studies, (49) Iowa 781.
 - biological changes in, determination, (46) Mich. 479.
 - caramel flavor, cause, (47) Iowa 382.
 - chemistry of formation and manufacture, (47) Minn. 313.
 - cost, building and equipment factors, (50) 97.
 - examination, methods, (46) 113.
 - food values, (41) Ill. 65.
 - grading in New Zealand, (45) 881.
 - import statistics, (42) 774.
 - in California, production and manufacture, (45) 174.
 - Indian, (42) 563.

Dairy—Continued.

products—continued.

international trade and production, (41) U.S.D.A. 892.

legislation in New York, (43) 176
lime determination in, (46) 680.
710.

manufacture, (44) 372.

manufacture, treatise, (45) 679.

marketing in Canada, (47) 595.

methods of investigation and standards, (41) 558.

of California, statistics, (50) 692.

off flavors in, (42) Wis. 377.

production, (43) U.S.D.A. 179.

statistics and marketing, (42) 473.

studies, (44) Calif. 776.

technical control, (48) 275.

testing, (48) 275.

use, (42) U.S.D.A. 254; (48) 578.

rations, computing, (43) Pa. 176.

record and feeding chart, (43) 176.

school at Rütli-Zollikofen, reports, (42) 269.

Show, National. Government exhibit in 1920, (44) U.S.D.A. 289.

sires. *See* Bulls and Sires.

small, minor equipment for, (48)

West.Wash. 479.

special, transcontinental, (49) 100.

statistics, availability and usefulness, (46) 177.

statistics, handbook, (48) U.S.D.A. 273.

statistics of Michigan, (43) 272.

stock, pasturing experiments, (42) U.S.D.A. 370.

stock, scoring exhibits in, (50) 195.

stock, tendency to replace beef and work animals, (42) U.S.D.A. 171.

utensils, sterilization, (41) 372, 774.
775; (44) 371; (45) Ill. 277, 679.

wastes, treatment and disposal, (50) N.Y.Cornell 487.

Dairying—*see also* Creamery, Butter, Cheese, Milk, *etc.*

adaptation for, (49) Miss. 222.

and agriculture, (50) 891.

climatic conditions controlling, (41) U.S.D.A. 417.

cooperative—

effect on a community, (41)

U.S.D.A. 677; (43) 291.

in England, (41) 776.

in India, (41) 776; (43) 192.

in Missouri, (46) 292.

problems, (43) 580.

effect of dry milk industry, (47) 61.

experiments, (47) Wis. 481; (49) Okla. 475, Wis. 679, Fla. 874.

experiments and tests at Derby Show, (48) 78.

extension program in, (50) U.S.D.A., 695.

importance of, (43) U.S.D.A. 490.

improving profits in, (41) 676, 677.

in Alberta, reconstruction, (49) 73.

in Bavaria, (48) 773.

Dairying—Continued.

in Broome County, (47) N.Y.Cornell 578.

in Canada, (43) 779; (48) 773; (50) 676.

in Canada, statistics, (49) 75.

in China, (42) 771; (46) 573.

in Czechoslovakia, (50) 875.

in Europe, (48) 576.

in Florida, (47) 581.

in France, (44) 891.

in Germany, (43) 177.

in India, (42) 771.

in Ireland, (50) 676.

in Ireland, decline, (44) 573.

in Italy, (42) 269.

in New Hampshire, (46) 273; (50) 390.

in New York State, (49) 177.

in New York State, statistics, (50) 581.

in New Zealand and Australia, (50) 377.

in Norway, cost accounting data, (44) 872.

in Ontario, (44) 191.

in Porto Rico, P.R. (48) 479; (50) 676.

in Quebec, (45) 578.

in Rhodesia, (41) 873.

in South Africa, guide, (49) 474.

in South Australia, (49) 166.

in Switzerland, statistics, (50) 581.

in United States, (49) U.S.D.A. 390.

in United States, treatise, (45) 174.

in Vermont, historical review, (49) 675.

in Victoria, further development, (42) 593.

instruction in, (49) 96.

labor requirements, (48) 687.

lessons on, (41) U.S.D.A. 197; (48) 297.

manual, (43) 580; (48) 877; (49) 376.

methods, (49) 276.

on a business basis, (44) 691.

outlook for, (47) 595.

publications on, (50) U.S.D.A. 73.

research institute at Reading, (43) 779.

statistical references, (42) 174.

textbook, (48) 273.

treatise, (42) 496; (46) 73; (49) 778; (50) 780.

use of aluminum in, (47) 282.

with purchased feeds only, (41) 473.

Dairymen's Association and Dairy School of Quebec, report, (47) 581; (48) 772; (49) 778.

Daisy—

flowers in insect powder, (41) U.S.D.A. 550.

Michaelmas, disease, (49) 45, 50, 250.

ox-eye, floral variations in, (43) 729.

Dakin's solution—*see also* Chloramin-T and Hypochlorite.

use, (41) 376; (43) Wyo. 179.

Dalbergia—

- latifolia, canker of, (41) 55.
- sissoo, notes, (41) 522.

Daldinia—

- concentrica, notes, (50) 42.
- vernica, studies, (41) 546.

Dam cores, hydraulic, pressures in, (42) 573.

Damping-off—

- disease, notes, (50) 352.
- fungi, direct inoculation methods, (48) 241.
- in forest seed beds, control, (47) 154.

Dams—

- and levees, hydraulic fill, (46) 779.
- cause of failure, (43) 281.
- construction, treatise, (47) 790.
- earth and rock fill, core walls, (47) 887.
- earth, construction, (42) 384.
- earth, design, (49) 587.
- earth, failures, (49) 383.
- earth fill, construction, (48) 89.
- hydraulic fill, determining pressure, (41) 582.
- hydraulic fill, testing, (43) 280.
- measuring upward pressure under, (43) 589.

Damselies, relation to fish culture, (44) 352.

Dandelion—

- control by spraying, (41) 537.
- eradication from lawns, (43) N.Y.State 535.
- fall, eradication, (44) Oreg. 826.
- seeds, germination tests, (43) N.Y. State 535.
- vitamin B in, (47) 267.

Danish experiment stations, history, (50) 28.

Danthonia pilosa, analyses, (50) 168.

Darlingtonia californica, absorption of nutrients by, (42) 629.

Darluca sorghi, notes, (47) 544.

Darning, energy expenditure during, (44) 66.

Darso—

- and darso silage, composition and digestibility, (45) Okla. 373.
- description and analyses, (43) Okla. 137.
- feeding value, Okla. (43) 137; (47) 71.
- seed, digestibility and productive value, (47) Tex. 472.
- silage v. sunflower silage for baby beef, (45) Okla. 375.
- variety tests, (49) Okla. 428.
- yields, (43) Ariz. 733.

Dasheen meal, preparation, (41) 65.

Dasheen shoots, forcing, (44) U.S.D.A. 145.

Dasheens—

- calcium oxalate in, (41) 134.
- notes, (41) 538.
- storage fermentation, (41) 155.
- use for greens, (42) 138.
- vitamins in, (42) 461.

Dasyneura—

- leguminicola, new parasite on, (49) 157.

- rhodophaga, studies, (41) U.S.D.A. 165.
- vaccinii, parasite of, (43) Mass. 158.

Dasyscypha calycina, notes, (44) 347.

Datana ministra, remedies, (41) 662.

Date—

- disease, notes, (41) Ariz. 345; (44) 346.

- diseases in Morocco, (45) 54.

- industry, (43) Ariz. 745.

- investigations, (41) Ariz. 342.

- leaf disease, notes, (45) 843.

- meal, analyses, (41) Can. 565.

- mite, description, (47) 558.

- palm disease in Morocco, (50) 249.

- palm, insects affecting, (47) 758.

- palm juice, making gur from, (45) 209.

- palm scale, red, studies, (45) 757, 758.

- palms, culture experiments, (48) U.S.D.A. 235.

- palms, insects affecting, (45) 552.

- pasteurizing and ripening apparatus, (41) Ariz. 314.

- rot, notes, (48) Ariz. 449.

Dates—

- analyses, (48) Calif. 506.

- breeding experiments, (41) Ariz. 342.

- culture experiments, (43) U.S.D.A. 339.

- culture experiments in Arizona, (50) U.S.D.A. 138.

- culture in Iraq, (50) 39.

- curing, (44) Calif. 737.

- dehydrating for carton packing, (48) Calif. 506.

- Ephestia on, (45) 759.

- fertilizer experiments, (48) Calif. 533.

- for Yuma Mesa, (42) Ariz. 341.

- insects affecting, (44) 548; (45) 359; (46) 558.

- production in Northern Africa, (45) 539.

- propagation, (44) Calif. 737.

- propagation from seeds, (46) 235.

- propagation method, (43) Ariz. 740.

- ripening, (44) 443.

- Saidy, of Egypt, (48) U.S.D.A. 738.

- self-sterility studies, (45) Ariz. 438.

- vacuum fumigation for, (45) 359.

- varieties of Derna Oasis, (45) 643.

- variety tests, (43) U.S.D.A. 339; (44) Ariz. 532.

Datisca cannabina, root tubercles, (44) 630.

Datura—

- breeding experiments, (42) 443.

- graft-infectious disease resembling a mutation, (47) 524, 525.

- metel as source of scopolamine, (41) 825.

- mutants, (47) 221, 822.

- mutants, causes of sterility, (49) 24.

- mutants, phenomena, (44) 327.

- stramonium, breeding experiments, (49) Wis. 630.

- Datura*—Continued.
 stramonium, microsporogenesis in, (44) 726.
 stramonium, mutation in, (41) 634.
 stramonium, ovular metamorphoses, (44) 630.
- Daturas*—
 affected by mosaic, alkaloidal content, (50) 746.
 inheritance in, (46) 430.
- Daubentonia longifolia* poisonous to livestock, (42) U.S.D.A. 879; (44) 678.
- Daulis ferruginea*, notes, (49) 550.
- Davainea*—
 proglottina in poultry, (48) 183.
 proglottina, life cycle, (50) 482.
 spp., notes, (44) Kans. 281.
 spp., transmission, (41) 685, 881.
- Day, length of—
 effect on flowering and fruiting, (43) 819.
 effect on plant activity, (42) 818; (47) 225.
- Death camas—
 identification, (42) 776.
 poisonous to livestock, (43) Nev. 273; (45) Ariz. 479; Wyo. 479; Nev. 782; (47) U.S.D.A. 181, U.S.D.A. 878; (50) 78.
 poisonous to livestock, control, (42) 879.
 studies, (41) Nev. 280.
- Decatoma flamminneiventris*, notes, (45) 459.
- Decilaus citriperra*, habits and control, (43) 456.
- Decticus verrucivorus*, absence of complement in blood, (41) 754.
- Deer fat, digestibility coefficients, (47) U.S.D.A. 560.
- Deer mouse, inheritance of microscopic hair characters, (50) 731.
- Deer, whitetail, in New York, protection, (42) 545.
- Deer-fly fever, studies, (42) 476.
- Deficiency disease, *see* Diet deficiency.
- Degeeria collaris*, parasite of, (47) 261.
- Deguelia* (Derris) spp. as insecticide, (41) 661.
- Dehydrators—
 farm, (50) 97.
 types in California, (46) Calif. 509.
- Deilephila lineata livornica* in vineyards, (45) 854.
- Delaware—
 College, notes, (41) 798; (42) 797; (43) 99, 198; (44) 496; (47) 197.
 Station, notes, (41) 798; (42) 197, 398, 797; (43) 198; (44) 496; (45) 95; (46) 195; (47) 197; (48) 299; (49) 98, 396, 600; (50) 697.
 Station, report, (41) 198; (45) 698.
 Station, report of director, (44) 495; (46) 698; (48) 693.
 University, notes, (44) 699; (45) 95; (48) 299; (49) 396, 600; (50) 697.
- Delphacidae*, North American, studies, (50) 756.
- Delphastus*—
 catalinae, importation, (41) Fla. 548.
 catalinae, notes, (42) 455.
 sp. in Florida, (44) 854.
- Delphax saccharivora*, notes, (46) 558.
- Delphinium*—
 andersonii poisonous to livestock, (43) Nev. 273.
 glaucum or brownii, identification, (42) 776.
 spp., chemical examination, (49) Wyo. 476.
 spp., toxicity, (41) Wyo. 407.
- Delphiniums*, treatise, (50) 141.
- Delphiniums*, variety tests, (41) 242.
- Deltoccephalus* species, descriptions, (44) 251.
- Dematium pullulans*, notes, (46) 554.
- Dematophora necatrix*, notes, (45) 451, 653.
- Demodex*—
 ermineae n.sp., studies, (43) 80.
 folliculorum suis, notes, (43) U.S.D.A. 688.
 spp., studies, (43) 80.
- Demonstration farm, national, in Great Britain, (43) 600.
- Dendrobiella aspera*, notes, (45) 258.
- Dendrocerus*, new species and variety, (41) 261.
- Dendroctonus*—
 brevicomis, *see* Pine beetle, western.
 frontalis, *see* Pine beetle, southern.
 valens, *see* Turpentine beetle, red.
- Dendrodochium paraense* n.sp., notes, (42) 46.
- Dendrograph* and its work, (45) 333.
- Dendrograph*, study and use, (46) 24.
- Dendrometer*, description, (45) 645.
- Dendrophoma obscurans* n.sp., description, (43) Ill. 753.
- Dendrophoma* sp., notes, (42) 150.
- Dendrosinus bourreriae* n.sp., description, (44) 760.
- Dendrostilbella macrospora* n.sp., symbiosis with a bacterium, (42) 350.
- Dengue fever—
 etiology, (49) 657.
 in Louisiana, (48) 751.
 method of spread, (50) 156.
- Denitrification—
 as affected by organic substances, (42) 19.
 for sewage purification, (50) 288.
 in tropical soils, (47) 214.
- Denitrifying bacteria, (44) 133.
- Denmark a cooperative commonwealth, treatise, (46) 292.
- Deodar, yield tables, (43) 840.
- Department of Agriculture, *see* United States Department of Agriculture.
- Depluming louse of fowls, (44) 881.
- Deporaus tristis*, papers on, (50) 256.
- Depreciation, calculating, (48) 687.

- Depressaria heracliana*, see Parsnip web-worm.
- Deraeocapsus*, new genus, erection, (46) Minn. 854.
- Deraeocoris*, North American species, (45) 852.
- Deraeocoris*, North American species, keys, (46) Minn. 854.
- Deretaphrus oregonensis*, notes, (41) 259.
- Dermacentor*—
- albipictus*, notes, (50) Minn. 153.
 - reticulatus*, notes, (42) 382; (43) 83, 84.
 - spp., relation to fistulous withers, (41) 480.
 - spp., transmission of spotted fever by, (48) 279.
 - venustus*, cause of death of heifers, (48) 677.
 - venustus*, control, (43) 164; (46) 59, 555.
 - venustus*, paralysis due to, (50) 762.
 - venustus*, studies and control, (41) 57.
- Dermacentroxenus rickettsi*, notes, (43) 60.
- Dermanyssidae*, keys and descriptions, (49) 455.
- Dermanyssus gallinae*—
- and *Liponyssus bursa*, comparison, (42) U.S.D.A. 656.
 - control, (45) Mont. 586.
- Dermatitis caused by *Megalopyge opercularis*, pathology, (48) 357.
- Dermatobia hominis*, biology, (41) 461.
- Dermatophilus penetrans*, notes, (50) 55.
- Derocentrus*, new genus, description, (41) 261.
- Derolomus basalis*, notes, (41) Fla. 549.
- Derris—
- as a parasiticide, (50) 755.
 - as an insecticide, (41) 661.
 - elliptica extracts, insecticidal value, (49) 152.
 - powder, insecticidal value, (47) 53.
- Deschampsia caespitosa*, analyses, (41) Wyo. 333.
- Desert—
- Egyptian, bioclimatic study in, (49) 208.
 - land in United States, (41) U.S.D.A. 693.
 - mistletoes, sap concentration, (41) 632.
 - plants, origin and action, (41) 25, 133.
 - plants, root growth, oxygen response, (41) 132.
 - plants, seasonal changes in water relations, (45) 335.
 - plants, size and form of leaves in, (45) 335.
 - plants, transpiration changes in, (46) 26.
 - soils of State of Kapurthala, reclama-tion, (49) 323.
 - valley, imperfectly drained, vegetation, (41) 220.
 - valley, vegetation, (46) 26; (48) 826.
- Desert—Continued.
- watering places in Arizona, routes to, (49) 383.
 - watering places in California, routes to, (46) 380.
- Deserts—
- formation on California coast, (47) 810.
 - soil and air temperature, (47) U.S.D.A. 415.
- Desiantha nociva*, control, (49) 761.
- Desiantha nociva*, notes, (48) 852.
- Desiccation of Africa, (44) 208, 811.
- Desmocercus* spp., notes, (46) 856.
- Desmodium*, agricultural value, (49) 34.
- Desmodium* leaf miner, notes, (47) 658.
- Desmodium leiocarpum*, analyses and feed-ing value, (45) 131.
- Desmorcerus palliatus*, biology, (50) 661.
- Destructive Insect and Pest Act of Canada, (50) 151, 454.
- Detroit Milk Commission, report, (43) Mich. 178.
- Development Act of Great Britain, editorial, (48) 701.
- Dew, effect on boll weevil poisoning, (43) 162.
- Dew formation, (50) 414.
- Dewberries—
- breeding experiments, (43) 536.
 - culture, (50) 543.
 - culture experiments, (44) Alaska 336.
 - hardy varieties, (45) 742.
 - insects affecting, (45) 655.
 - pruning, (48) Mich. 342.
- Dewberry—
- diseases, control, (43) Ill. 847.
 - orange rust, notes, (44) 54, Conn.State 150; (50) 149.
 - rot, origin of cavities in pycnidia, (49) 349.
 - thrips, notes, (47) Fla. 656.
- Dewberry-raspberry hybrid—
- notes, (46) Tex. 335.
 - renamed, (49) Tex. 435.
- Dextrin—
- adsorption in solution and at inter-faces, (47) 802.
 - determination, (46) 506.
 - gold number determination, (43) 12.
 - v. starch in nutrition of tadpoles, (41) 469.
- Dextrins—
- cellulose, studies, (43) 524.
 - synthetic, constitution, (50) 505.
- Dextrose—
- action on amino acids, (42) 210.
 - and levulose, ratio of utilization by plants, (43) 730.
 - decomposition, acetaldehyde in, (45) 611.
 - determination in blood, (45) 110.
 - determination, table for, (46) 506.
 - manufacture, (47) 508.
 - solution, effect on bud growth of cut-tings, (49) 834.
 - use by plants, (42) 728.

Diabetes—*see also* Insulin.

- boiled vegetables in, (42) 558.
- control by fasting and dietary restriction, (43) 862.
- dietetic treatment, causes of failure, (43) 862.
- effect of fasting, compared with replacement diet, (50) 766.
- effect of protein diets, (43) 862.
- experimental production in dog, (43) 370.
- insulin treatment in, (50) 766.
- mellitus, prevention, (45) 65.
- metabolism, (47) 370.
- relation to alkali excess, (41) 364.
- relation to ductless glands, (44) 263.
- studies, (44) 65.
- treatment, (42) 558.
- treatment, monograph, (43) 370.
- dietary, (42) 558; (44) 667; (45) 65.
- diets, vegetables in, (46) 570; (48) 360.
- foods, (43) 63.
- foods, analyses, (42) 162; (43) Conn.State 861.
- foods, inspection, (47) Conn.State 559.
- foods, inspection and analysis, (45) Conn.State 365.

Diabetics—

- diets for, (41) 561, 562.
- metabolism, (41) 761.
- nature of blood sugar of, (49) 715.

Diabrotica—

- duodecimpunctata, notes, (47) N.Y.Cornell 848; (50) 747.
- spp., parasite of, (46) 461.
- spp., relation to cucumber wilt, (43) U.S.D.A. 245.
- vittata, *see* Cucumber beetle, striped.

Diachaea leucopoda, notes, (45) 144.

Diachasma fullawayi, notes, (50) 55.

Diachasma spp., studies, (42) 654.

Diaeris virginica, notes, (41) 256.

Diaeretus rapae, larval stages, (49) 559.

Diagnostic methods, treatise, (46) 880.

Dialeurodes citri, *see* White fly, citrus.

Diallel crossing, use of term, (43) 866.

Diallel crossings—

- method of calculation, criticism, (48) 468.
- with fowl, (48) 764.
- with trout, analysis of results, (46) 268.

Dialysis, continuous, apparatus for, (44) 610.

Diamond-back moth—

- on cabbage, (42) 52.
- summary, (50) 53.

Dianthus—

- armeria, control, (44) Pa. 737.
- caryophyllus, ovular metamorphoses, (44) 630.

Diapheromera femorata, *see* Walking stick.

Diaporthe—

- phascolorum, notes, (45) N.C. 443.
- sojae n.sp., description, (50) 840.
- taleola on the oak, (41) 752.

Diaprepes—

- abbreviatus, control, (49) V.I. 352.
- abbreviatus, notes, (43) 252; (44) 57; (45) 853; (50) V.I. 555.
- abbreviatus on sugar cane, (46) 534.

Diarrhea—

bacillary white—

- control, (46) N.J. 584; (47) Mass. 789; (48) Mass. 778.
- incubation studies, (42) Minn. 886.
- of chicks, (41) Conn.Storrs 880; (50) Ill. 285, Mass. 383, 884.
- of poultry, (46) Mich. 584; (47) Md. 73.

white, in calves, (46) 582.

Diarthronomyia hypogaea, *see* Chrysanthemum gall midge.

Diaspis pentagona, biological control, (41) 847.

Diaspis pentagona, parasite of, (50) 459.

Diastase—

- activities within plants, (44) Del. 424.
- amylolytic action, method of testing, (42) 609.
- as affected by heat, (45) 880.
- effect on cellulose dextrins, (43) 524.
- formation in barley grain, (41) 131.
- occurrence in sweet potatoes, (44) 615.
- of milk, effect on starch, (47) 503.
- saccharogenic power, estimation, (44) 613.
- solution, effect on bud growth of cuttings, (49) 834.

Diastatic—

- activity, determination, (44) 802.
- capacity, determination, (43) 802.
- ferments, effect on flour strength, (49) 12.
- power, estimation, (50) 196.

Diatoms—

- of New Jersey soils, (43) 217.
- vitamin A in, (47) 662, 769.

Diatraea—

- auricilia, notes, (43) 852.
- lineola, notes, (44) Ariz. 548.
- saccharalis, *see* Sugar cane borer.
- saccharalis crambidoides, notes, (48) 852.
- spp., life cycle and habits, (50) 155.
- zeacolella, *see* Cornstalk borer.

Diazo value of urine as affected by nutrition, (43) 368.

Dibrachys—

- boucheanus, notes, (48) 158.
- cavus, parasite of flies, (42) 362.
- elisiocampae, parasitism by, (45) 856.
- sp., notes, (48) 158.

Dibromoxyleneol sulphonephthalein, use as indicator, (50) 311.

Dicalcium silicate effect on acid soil, (44) 24.

Dice casting and pedigree selection, (47) 667.

Dicerca pectorosa, notes, Oreg. (44) 850; (49) 555.

- Dichaetoneura leucoptera*, parasitism by, (44) 655.
- Dichloramin-T—*see also* Chloramin-T, Dakin's solution, and Hypochlorite.
action of, (42) 174.
germicidal value, (44) 680.
- Dichlorobenzene, p-, larvicidal value, (42) 54.
- Dichlorocresol, effect on plants, (46) 544.
- Dichlorohydroquinone for spot disease on rubber, (50) 452.
- Dichotomy, transmission of, (45) 32.
- Dicotyledons and monocotyledons, development, (45) 629.
- Dicranotropis maidis, notes, V.I. (44) 351; (45) 150.
- Dictionary of fertilizer materials, (49) 422.
- Dictyocaulus—
filaria, effect on coagulation of blood, (45) 477.
filaria eggs, studies, (46) 59.
filaria, life history, (41) 878.
spp., life histories, (44) 875.
viviparus, notes, (48) 85.
- Dictyophora phalloidea, notes, (46) 45.
- Dictyospermum scale, notes, (47) U.S.D.A. 156.
- Dictyothrips aegyptiaca, notes, (41) 455.
- Dicyandiamid—
determination, method, (44) 711.
effect on corn growth, (42) 429.
effect on plant growth, (41) 815; (45) 330; (46) 625.
formation, (44) 421.
in calcium cyanamid, determination, (43) 413, 804.
in fertilizers, determination, (45) 804.
salts, ammonification tests, (44) 318.
toxic action in soils, (43) 426.
- Dicyandiamidin, determination, (50) 9.
- Dicyclus fuscicornis, parasitism by, (46) 158.
- Dicymolomia julianalis—
differentiation from pink bollworm, (45) 156.
studies, (46) N.Y.Cornell 465.
- Dicyphus—
sp., notes, (50) V.I. 555.
tabaci, notes, (44) 653.
- Diderma spp., notes, (45) 144.
- Didymana perforans on lettuce, (43) 152.
- Didymella applanata, notes, (47) 749.
- Didymellina iridis, studies, (45) 547.
- Didymium squamulosum, notes, (45) 144.
- Diet—*see also* Food and Nutrition.
acid and base, effect on urine composition, (49) 764.
acid- and base-forming, effect on calcium metabolism, (48) 756.
acid-forming, relation to disease susceptibility, (41) 855.
American Red Cross, in China, (47) 660.
and excretion of Asiatic races in Singapore, (41) 67.
and ophthalmia, review of literature, (45) 569.
- Diet—Continued.
antineuritic vitamin in, (42) 365.
balancing, graphic method, (43) 167.
basal, for rat feeding experiments, (48) 63.
change of type, suggestions, (42) 365.
choice by rats and mice, (46) 758.
complementary factors, (42) 460.
deficiency disease, (44) 262; (46) 359, 869.
deficiency disease—
affecting feet of soldiers in trenches, (41) 365.
deficit in animal tissues, (46) 761.
in pigeons, pathogenesis, (41) 264.
pathogenesis, (42) 166, 463; (43) 664; (50) 865.
pathological physiology, (48) 163.
relation to edema, (42) 760; (43) 66.
studies, (47) 369.
deficiency diseases, (42) 463; (43) 166, 262, 263, 264, 461, 462; (44) 361, 667; (45) 367, 667.
deficiency diseases—*see also* Beriberi, Rickets, Scurvy, etc.
and vitamins, (41) 671; (48) 162.
in Europe during the war, (41) 765.
in French army, (43) 168.
in Labrador, (46) 63.
in Vienna, (43) 667.
of man and animals, comparison, (42) 776.
pathogenesis, (41) 562.
symptoms, (45) 467.
deficient—
cause of sterility, (46) 261.
effect on adrenal glands, (45) 264.
effect on blood, (49) 565.
effect on endocrine glands, (44) 262.
effect on growth and efficiency, (42) 460.
effect on intestines, (42) 463.
effect on monkeys, (43) 666.
histopathological changes in rats from, (45) 565; (47) 565.
in animal fat, effect, (45) 865.
in calcium and vitamin A, effects, (47) 567.
in vitamin C, changes in organ weight from, (45) 65.
in vitamins, and opsonins, (48) 862.
in vitamins, effect on lactation, (48) 162.
relation to cancer, (43) 667.
relation to degeneration of rat testes, (42) 468.
relation to phosphatic urinary calculi, (42) 462.
studies, (42) 468, 664, 665, 666, 667; (43) 62, 63, 165, 369.
diabetic, *see* Diabetic diet.

Diet—Continued.

- during pregnancy, effect on nutrition of offspring, (50) 261.
- effect on—
 - alkaline reserve of blood, (41) 765.
 - blood protein regeneration, (41) 859.
 - course of disease in infants, (45) 164.
 - energy expenditure in work, (45) 464.
 - excretion of phenols and indican, (44) 563.
 - intestinal flora, (46) 366.
 - mammary secretion, (45) 863.
 - mother and young during lactation, (48) 160.
 - secondary anemia, (50) 262.
 - span of life and fertility, (45) 864.
 - teeth, (41) 365, 471, 858.
 - wound healing, (41) 471.
- fat in, dispensability, (42) 757; (44) 666; (45) 164.
- faulty, relation to bone structure, (48) 464.
- for adults and children, textbook, (43) 494.
- for invalids, treatise, (45) 697.
- for the family, (48) 159.
- free from vitamin A, experiments with, (45) 264.
- growth-promotion properties, (45) 866.
- high protein, effect on blood catalase, (48) 161.
- high protein, effect on kidneys, (50) 162.
- in Kansas institutions, (46) 468.
- in university boarding halls, (46) 562.
- kitchens at Peoria State Hospital, (50) 360.
- low, during the war, effects, (45) 63.
- meatless, cookbook for, (41) 68.
- minerals in, importance, (46) 259.
- mixed, effect on blood regeneration, (44) 564.
- native, on South Pacific Island, (48) 859.
- of Australians, (46) 563.
- of British and Indian troops in relation to disease, (43) 262.
- of Chinese, nutritive value, (44) 664.
- of employees in anilin dye industry, (42) 863.
- of Filipinos, analysis, (48) 858.
- of foreigners in New York City, (44) 664.
- of hotel employees, supervising, (43) 663.
- of immigrants, (45) 63.
- of Korean people, (48) 858.
- of laborers in Glasgow, (42) 863.
- of prisoners of war in Germany, (41) 763.

Diet—Continued.

- of purified food substances, production of rickets by, (48) 761.
 - of the Army, (41) 854, 855.
 - of various classes in Denmark, (47) 59.
 - optimum, (47) 363.
 - planning, (49) Ark. 364.
 - polished rice, effect on pigeons, (45) 867.
 - principles of, traveling exhibit, (45) 63.
 - proportions in, (49) U.S.D.A. 158.
 - protein deficiency, cause of edema, (42) 557, 864.
 - racial, need for information on, (48) 259.
 - relation to—
 - climatic conditions, (46) 561.
 - edema in monkey, (42) 365.
 - nutrition, (47) 164.
 - pellagra, (47) 269.
 - polyneuritis, (42) 366.
 - tropical diseases, (50) 865.
 - restricted, effects, (41) 763, 854, 862; (42) 62; (49) 458, 766.
 - rickets-inducing, acid base ratio of, (49) 65.
 - rickets-producing, effect of varying constituents, (48) 363.
 - rôle in creatinuria of man, (46) 757.
 - scorbatic, effect on adrenal glands, (42) 464.
 - sugar and fat minimum in, (41) 468.
 - synthetic, for nutrition of pigeons, (49) 160.
 - value of coarse ground grain in, (43) Can. 366.
 - vegetarian, effect on growth and reproduction, (41) 369; (49) 458.
 - vegetarian, effect on pigmentation, (47) 265.
 - vitamin A deficient, effect on blood platelets, (49) 61.
 - vitamin A deficient, effect on rats, (48) 260.
 - vitamin-free, metabolism of, (44) 861.
 - vitamin-rich, effect on backward children, (46) 868.
- Dietaries—
- for colleges, hostels, etc., (41) 68.
 - for hospitals for insane, (42) 458.
 - hospital, (41) 561.
 - military hospital, (41) 855.
- Dietary factor essential for reproduction, (48) 864; (50) 261.
- Dietetics—
- and public health, (46) 862.
 - applied, in outpatient departments, (47) 764.
 - effect of war food problems on, (42) 364.
 - field, relation to social service, (42) 364.
 - for high schools, (44) 898.
 - teaching to student nurses, (46) 697.
- Diethyl red, usefulness as reagent, (49) 520.

Diethylphthalate, test for, (50) 507.

Dietitian—

- hospital, greater sphere of usefulness, (42) 365.
- hospital, training and duties, (44) 259.
- in social life, rôle, (42) 364.

Dietitians—

- in hotels, (45) 261.
- in Illinois institutions, duties, (46) 260.
- professional training, (46) 696, 697.

Dietotherapy, treatise, (43) 261.

Diffusion rate, effect on concentration of electrolyte, (46) 126.

Digestion—

- as affected by tea, coffee, and cocoa, (44) 665.
- as affected by worry, (44) 664.
- effect of pH value of foods, (50) 854.
- effect of raw onions, (45) 764.
- effect of vitamins, (47) 265.
- experiments, *see specific foods and animals*.
- in the human stomach, studies, (41) 467, 857.

Digestive ferments, (41) 781.

Digitalis—

- development of leaf glucosids in, (42) 227.
- purpurea, peloria in, (45) 32.
- spp., hybrids, sterility in, (44) 819.

Digitaria didactyla, notes, (41) Fla. 528.

Diglyphosema anastrephae n.sp., description, (41) 261.

Digonatopus lucidus n.sp., description, (43) 857.

Dihydroxyphenylalanin, constituent of velvet bean, (44) 710.

Dilatometer, use, (45) 336.

Dille, A., biographical sketch, (43) 100.

Diloboderus abderus, notes, (43) 450.

Dilophia graminis, relation to Dilophospora graminis, (47) 45.

Dilophospora graminis on cereals, (47) 45.

Dinemasporium graminum, description, (49) 445.

Dioeciousness, nature of, (42) 820.

Diorymellus laevimargo, notes, (41) Conn. State 159.

Dioscorea—

- alata, culture experiments, (41) 832.
- esculenta, culture, (42) 439.
- prehensilis, disease of, (41) 749.

Diospilus oleraceus, notes, (50) 57.

Diospyros kaki, culture in United States, (42) Calif. 346.

Diphenylamin reaction, color changes of, (43) 505.

Diphtheria—

- antitoxin in blood of normal horses, (47) 680.
- antitoxin, rate of disappearance in rabbits, (49) 478.
- antitoxin, standardization, methods, (42) 676.
- avian, epidemic, (50) 284.

Diphtheria—Continued.

- avian, etiology and treatment, (49) 482.
- avian, relation to chicken pox virus, (44) 183.
- avian, studies, (49) 81.
- bacilli in horses, (44) 881.
- fractioned antitoxic serums, (42) 475.
- immunization, oral route for, (50) 478.
- toxin injection in horses, effect, (48) 378.

Diplocarpon rosae, notes, (43) 152; (44) 750.

Diplocadium theobromae, notes, (49) 540.

Diplococcus, anaerobic, from wounds, (41) 476.

Diplococcus sp., notes, (46) 777.

Diplodia—

- cacaicola, notes, (42) 49, 646; (46) 647; (48) 45.
- corchori, notes, (42) 145; (43) 444; (44) 445; (45) 48, 843; (48) 47.
- gossypina, notes, (43) 243.
- griffoni, notes, (43) 753.
- gumming, notes, (49) Calif. 649.
- natalensis, control, (50) U.S.D.A. 149.
- natalensis, notes, (42) Calif. 842; (48) P.R. 247.
- natalensis, temperature relations of growth, (49) 540.
- natalensis, utilization of citric acid by, (50) 630.
- on Hevea in Indo-China, (42) 354.
- pineae, notes, (47) 44.
- rapax, notes, (47) 356.
- sp., notes, (43) 45; (45) 653; (49) 839.
- spp., notes, (44) 842; (47) 348, 547.
- storage rots, (45) 648.
- studies, (43) Mo. 749.
- tubericola, notes, (49) Tex. 442.
- tubericola, utilization of glucose as source of carbon, (45) 354.
- zeae in seed corn, (46) 547; (49) 243; (50) 548.
- zeae, notes, (47) Iowa 350, Iowa 749; (48) Mo. 644; (49) Ohio 346, 542, Iowa 746; (50) Iowa 145.
- zeae on corn, (46) Del. 239.
- zeae on corn, cattle disease from, (44) 78.
- zeae, tests, (49) Ind. 580.

Diplodina lycopersici, notes, (47) 48.

Diplodinula phalaridis n.sp., description, (49) 445.

Diplotaxis erucoides in roots, (44) 430.

Dipodomys spectabilis, notes, (44) Ariz. 548.

Dipping—

- tanks for cattle, construction, (43) 90.
- tanks, management, (48) 179.
- vats, concrete, plans, (42) 779, 786.
- vats, plans, (42) Mont. 86; (44) 184; (47) 688.

Diprion simile, *see* Pine sawfly.

Dips—

- and dipping, (42) 174.
- carbolic, danger of poisoning sheep, (44) 377.
- for cattle tick, preparation, (44) 78.

Dipsacus laciniatus, leaf-base troughs, reaction of, (49) 520.

Diptera—

- anatomical studies, (46) N.Y.Cornell 459.
- and fungi, (48) 158.
- feeding on mollusks, (42) 454.
- key, (44) 451.
- life cycle in, (45) 251.
- muscoid, parasites of, (43) 662.
- myiasis-producing, notes, (47) 658.
- nematocera, male hypopygium, nomenclature of parts, (44) 59.
- new species, (46) 57.

Dipterocarps, Philippine, fiber studies, (46) 445.

Dipterocarpus—

- pilosus*, notes, (42) 840.
- spp., properties and uses, (49) 43.

Dirofilaria immitis, development of larvae in fleas, (45) 80.

Dirohinus sarcophagae—

- n.sp., parasite of flesh fly, (42) 551.
- notes, (50) 359.

Discella cacaoicola, notes, (45) 653; (49) 540.

Disease—

- control by machine dishwashing, (43) 261.
- dissemination in the Tropics, (42) 174.
- transmission, rôle of insects in, (41) 653.

Diseases—

- classification according to protective effort, (41) 778.
- classification by basal metabolic rate, (45) 66.
- contagious, diagnosis, prophylaxis, and therapy, (43) 76.
- deficiency, *see* Diet deficiency diseases.
- human, and animal parasites, (48) 253.
- in Roumania during the war, (41) 470.
- in Tropics, relation to food, (50) 865.
- infectious, carriers of, (48) 379.
- of animals, *see* Animal diseases and *specific diseases*.
- of plants, *see* Plant diseases and *specific host plants*.
- of the nervous system, interpretation, (49) 178.
- tropical, (49) 499.

Dishes—

- as carriers of tubercle bacilli, (46) 361.
- hand-washed v. machine-washed, bacterial count, (45) 62.

Dishwashing—

- energy expenditure during, (44) 66.
- machine, relation to disease control, (43) 261.

Disinfectant, Barrett's as soil insecticide, (44) 852.

Disinfectants—

- action on *Cryptococcus*, (48) 675.
- against chicken lice and fleas, (44) U.S.D.A. 162.
- bactericidal properties, testing, (46) 374.
- chemical, absolute and relative power, (43) 78.
- chemical, causes for variation in, (42) 879.
- cresol and substitutes for cresol soaps, (42) 675.
- culture media for testing, (43) 181.
- for blight control, (44) Oreg. 848.
- for tetanus spores, tests, (44) 780.
- formulas, (47) Ohio 638.
- fungicidal qualities, (45) 145.
- methods of analysis, (41) 412.
- new, (41) 189, 875; (45) 75.
- resistance of intracellular organisms to, (43) 822.

Rideal-Walker test, technique, (45) 807.

sed injury from, prevention, (43) 844.

standardization, (41) 781; (44) 679.

Disinfection and sterilization, treatise, (46) 310.

Disk harrow—

- for vineyards, tests, (41) 887.
- tests, (48) Calif. 590.
- types, (47) 190.

Disk harrows, studies, (49) Iowa 788.

Disking, tractor costs, (41) Pa. 486, 790.

Disking v. plowing, (41) Nebr. 434; (45) N.Dak. 226.

Disonycha maritima, notes, (48) 57.

Dissosteira longipennis, life history, habits, and control, (50) Colo. 52.

Distemper—

- canine, treatise, (48) 86.
- canine, treatment, (48) 679.
- respiratory, treatment, (41) 284.

Distillation—

- apparatus, (46) 111.
- fractional, receiver for, (46) 414.
- fractional, treatise, (47) 204.
- of waste western yellow pine, (46) U.S.D.A. 312.
- principles, treatise, (47) 501.

Distillers' dried grains—

- analyses, (41) Conn.State 176, R.I. 564, Can. 565, N.Y.State 868; (42) Mich. 63, 263, 560, N.H. 769; (43) Ky. 373, 867; (44) Mass. 671; (45) N.Y.State 469, N.J. 774; (46) Mich. 168; (47) Mass. 274, 275, Ind. 473, Conn.State 570, N.J. 570; (48) 68.
- composition and retail price, Conn. State, (45) 375; (47) 570.
- energy value, (47) 69.

Distilling—

- bulb, new form, (41) 311.
- column, description, (41) 615.
- industry, handbook, (41) 417.

Distol, anthelmintic value, (46) 684.

- Distoma hepaticum*, notes, (47) 186.
Distomiasis of swine, (47) 186.
 Ditch—*see also* Drainage and Irrigation.
 design and prevention of silt deposit, (46) 778.
 digging, dynamite for, (43) 480.
 digging, machinery in, (50) 885.
 Ditcher, tractor, tests, (45) 890.
Ditropinotus aureoviridis—
 life history, (45) 460.
 notes, (45) Mich. 252.
 Divining rod, use, (43) 478.
 Djali bras, agronomic data, (46) 230.
 "Djati" forest soils of Java, studies, (49) 16.
Dociostaurus maroccanus, notes, (46) 851.
 Dock, curly, as host of leafhopper, (46) Iowa 349.
 Dockage in wheat, method of determining, (43) U.S.D.A. 535.
 Dodder—
 combating, (50) 238.
 gall weevil, notes, (46) 661.
 in Idaho, control, (43) 833.
 in Italy, identification, (50) 439.
 injury to flax, (48) 47.
 life history and control, (44) U.S.D.A. 531.
 on citrus and olive, (43) 652.
 on onions, occurrence, (47) 351.
 prevalence in Great Britain, (49) 530.
 seed, devitalization, (41) 646.
 seeds, germination, (44) 233.
 seeds, testing, (50) 238.
 Dog—
 anatomy and physiology, atlas, (46) 778.
 flea—*see also* *Ctenocephalus* spp. and Fleas.
 flagellate, studies, (41) 781.
 hair, microscopic studies, (47) 81.
 kennels, planning and construction, (47) 391.
 meat, detection, (42) 315.
 Dogs—
 age and chemical development, (50) 569.
 bird, training and management, (47) 671.
 breeding and care, treatise, (49) 373.
 breeding, care, and training, (47) 671. 868.
 breeding experiments, (48) 868.
 breeds and varieties, (45) 775.
 cestodes of, keys, (43) 80.
 degeneration of testes, (43) 269.
 diseases and treatment, treatise, (46) 276; (48) 182.
 feeding experiments, (46) 68.
 German shepherd, breeding and care, (48) 272.
 Great Dane, inheritance of coat color, (43) 669.
 hookworms in, treatment, (46) 686.
 hunting, training, (47) 868.
 identification by nose prints, (50) 269.
 Dogs—Continued.
 imported, fecal examination of, (42) 180.
 internal parasites, treatment, (49) 684.
 parasitic infestation before birth, (49) 684.
 piebald spotting in, origin, (43) 669.
 prophylactic vaccination against rabies, (47) 385.
 rickets in, (49) Wis. 664.
 sheep-killing, (47) U.S.D.A. 775.
 spermatogenesis of, (43) 269.
 tonsils, paper on, (47) 80.
 Dogwood, twig growth, (49) 128.
Dolerus haematodis, notes, (49) 256.
Dolichocysta Champion, notes, (41) 551.
Dolichoderus bidens, notes, (47) 53.
Dolichos lablab—
 and *D. lignosus*, notes, (41) 523.
 breeding experiments, (41) 528.
 culture experiments, (41) Tex. 36.
Dolichurus stantoni, notes, (45) 755.
Dolomagnesium, fertilizing value, (44) 423.
Dolomagnesium for grape fertilization in France, (42) 737.
Dolomite, analysis, (48) 609.
 Domestic art or science, *see* Home economics.
 Doncaster, J., biographical sketch, (45) 369.
 Donkeys, blood of, (49) 683.
Doryctes radiatus, parasitism by, (46) 250.
Dothichiza populea, notes, (41) 546; (44) Conn.State 150.
Dothidella ulmi, development, (47) 755.
Dothiorella gregaria on walnut, (43) 350.
Dothiorella zeae, notes, (45) 842.
 Doughnuts—
 energy content, (42) 660.
 of low fat absorption, making, (46) 259.
 Douglas fir—
 adaptation in, (45) 141.
 and redwood, fire resistance, (50) 40.
 aphis in England, (46) 53.
 bordered pits in, effect of position of tori on creosote penetration, (42) 240.
 Chermes, life history, (50) 556.
 culture in Europe, (41) 541.
 decay in, (49) U.S.D.A. 755.
 description of genus, (44) 742.
 disease, new, (47) 652.
 distribution and habits, (50) 344.
 effect on snow melting, (41) 785.
 for wood-block pavement, (41) 790.
 forest, establishment, (43) 650.
 growth and yield data in Austria, (44) 47.
 growth rate and rainfall, correlation, (47) 836.
 in semiarid regions, distribution, (46) 445.
 inclined-bearing tests, (44) 285.
 of British Columbia, (46) 236.
 oleoresin, (41) 541.

Douglas fir—Continued.

- Phomopsis pseudotsugae on, (46) 244.
- region, forestry in, (43) 343.
- rusts of, (41) 353.
- sample plats, measurement, (44) 537.
- seed fly, notes, (48) 59.
- strength, effect of moisture, (46) 779.
- tests after long use, (42) 386.
- ties, volume table, (42) 240.
- time of planting test, (48) 240.
- tussock-moth injury, (41) 552.
- types, (48) 43.
- volume tables, (41) 838.
- western, uses and stresses, (44) 149.
- wood analysis, (42) 7.

Douglas spruce, culture in Australia and New Zealand, (49) 837.

Dourine—

- and complement fixation, (46) 774.
- colloidal gold test, (47) 684.
- control, (43) 272.
- cured stallions, carriers of trypanosomes, (44) 583.
- diagnosis, (46) 277, 774.
- diagnosis, Bordet-Gengou reaction in, (49) 481.
- diagnosis, effect of heat on serum, (47) 86.
- diagnosis, preparation of antigen, (47) 86.
- heredity transmission experiments, (49) 179.
- in Canada, (46) 485; (47) 181.
- in horses, (44) U.S.D.A. 81, 781.
- in horses, preventing infection, (49) 683.
- in South Africa, (41) 873.
- pathology, (42) 382; (50) 883.
- serodiagnosis, (45) 785; (48) 879.
- (slapzlekte) in South Africa, (42) 75.
- treatment, (49) 179, 400; (50) 81.

Doves—

- inheritance of exceptional color, (42) 765.
- physiology of reproduction, (46) 267.

Dragonflies—

- night-flying, notes, (45) 657.
- relation to fish culture, (44) 352.

Drain—

- gauges, Craibstone, (46) 811.
- pipe, fungus closing, (45) 357.

Drainage—

- and improvement of soils, (49) Oreg. 510.
- and improvement of white land, (49) Oreg. 588.
- and irrigation for Willamette Valley, (50) 285.
- and levee laws of Missouri, (44) 382.
- and prevention of river overflow, (47) U.S.D.A. 187.
- and sanitation, treatise, (47) 392.
- antimalarial, use of dynamite in, (41) 482.
- area, absorption and run-off on, (41) 686.
- areas of Nevada, (41) Nev. 728.

Drainage—Continued.

- areas, Piedmont, run-off from, (41) N.C. 686.
- as an antimalaria measure, (43) 85.
- assessments—against roads and railroads, (50) 586.
- assessments, imposition and collection in North Carolina, (49) 887.
- benefits, (49) 384.
- canals on Rio Grande project, cleaning, (48) 587.
- canals, poisoning stumps in, (45) 890.
- canals, run-off data, (45) N.C. 486.
- channel, dredged, erosion in, (41) 483.
- design, paper on, (42) 95.
- district assessments, (50) U.S.D.A. 886.
- districts, financing, (46) 98.
- ditch cross sections, inspection, (41) 483.
- ditch, formula for roughness in, (42) 577.
- ditch, hydraulic efficiency for different channel conditions, (41) 687.
- ditch, Tempe, Ariz. (41) 379; (43) 789; (44) 584.
- ditches, construction, explosives for, (49) 483.
- ditches, diagram for designing, (48) 780.
- ditches, dredged, water flow in, (43) U.S.D.A. 478.
- ditches, maintenance, (43) 280.
- ditches, open, design, (49) 588.
- ditching and reclamation, (50) 885.
- effects on alkali salts and plant food constituents, (49) N.Mex. 886.
- farm, (45) Oreg. 687.
- farm, correct methods of, (50) 385.
- farm, guide, (41) 884.
- for mosquito control, (42) Calif. 848; (46) 460.
- for Prince Edward Island, (41) 482.
- for reclamation of peat soils, (43) 420, Minn. 814.
- for reclamation of push soils, (43) Iowa 21.
- highway, (50) 586.
- history in England, (48) 384.
- household, pipe for, (41) 587.
- in Colorado, reports, (42) 478.
- in England and Wales, (41) 687.
- in Holland, projects, (42) 183.
- in Illinois, (50) 885.
- in India, (42) 277.
- in Mesilla Valley, (47) N.Mex. 89.
- in Michigan, (42) 481.
- in Minnesota, (45) 184.
- in peat and muck soils, (48) 196.
- in St. Lucia, (43) 689.
- in Switzerland, (44) 380.
- in United States, (41) U.S.D.A. 686.
- land, economics of, (49) 886.
- laws, handbook, (41) 482.
- laws of Illinois, (42) 481.
- laws of Minnesota, (46) 487.
- laws of Oregon, (42) 481.

Drainage—Continued.

- laws, proposed uniformity, (47) 287.
- layouts, (47) 187.
- machinery, farm, (43) 589.
- measurement, (46) 811.
- mole plows for, (41) 586.
- of irrigated lands, (41) 786; (42) 780; (44) 381; (48) 587.
- of meadows, (41) 230.
- of moors, (41) 687.
- of seeped lands, (49) Mont. 184.
- of soils, (45) Wis. 423.
- of swamped land in Argentina, (43) 478.
- outlets, design, law of variables in, (45) 587.
- papers on, (44) 379; (45) 587; (46) 381; (50) 99.
- pipe outlets, hydraulic tests of flap valves, (50) 587.
- projects, economics of, (49) 384.
- prospectus of, treatise, (41) 482.
- pump, of marsh land, (46) Wis. 185.
- pumping plants, tests, (48) U.S.D.A. 183.
- specifications, standard, (48) 196.
- structures, design, (44) 200.
- structures of roads, design, (43) U.S.D.A. 387.
- studies, (44) Oreg. 719; (49) Wis. 686.
- subgrade, tests, (46) U.S.D.A. 187.
- systems in Iowa, run-off determinations, (42) 81.
- systems, installing, (45) Ohio 486; (50) 385.
- tile, benefits from, (42) Ohio 482.
- tile, construction, community, (43) U.S.D.A. 478.
- tile, construction of districts, (41) 786.
- tile, cost and value of improved lands, (49) 685.
- tile, experiments, (42) Wis. 384.
- tile, for moors in Holstein, (43) 185.
- tile, system in South Carolina, (42) 277.
- tile, systems in West Virginia, (42) 482.
- tile, systems, treatise, (42) 577.
- tractor ditcher for, tests, (45) 890.
- treatise, (43) 280; (44) 381, 685; (47) 88.
- underdrainage systems, (41) 883.
- vertical, (47) Mich. 187.
- water of soils, effect of lime on composition, (47) 323.
- water, removal of mineral plant food by, (47) Ky. 122.
- water, washing out of nitrates by, (43) 19.
- waters, nitrogen losses in, (44) 814.
- waters, sulphur lost in, (49) 727.
- work, estimating cost, (45) 890.

Drains—

- costs of maintenance, (47) 88.
- determination of distance between, (47) 88.

Drains—Continued.

- large-size, segment block for, (41) 483.
- spacing, relation to soil properties, (50) 84.
- tile, effect in prairie section, (44) Ala.Col. 882.
- tile, effect on ground water level, (45) 81.
- Drain tile—
 - cement and clay, tests, (43) 689.
 - concrete, effect of organic decomposition products, (49) 790.
 - concrete, stresses in, (47) 388.
 - farm, specifications, (42) 277.
 - flow of water in, (43) U.S.D.A. 788; (46) 778.
 - for acid peat, (46) Wis. 186.
 - for U. S. Reclamation Service, inspection, (43) 589.
 - Iowa shale and concrete, (41) 786.
 - mains, capacities for, (44) 379.
 - size standardization, (47) 686.
 - standards, (46) 285.
 - studies, (49) Wis. 686.
 - supporting strength, (44) 83.
 - testing, (41) 786.
 - testing, standard methods, (46) 283.
- Dredge pumps, worn runners on, effect, (44) 783.
- Dredges, types, (43) 887.
- Dredging engineering, treatise, (43) 887.
- Dressing, energy expenditure during, (44) 66.
- Dressmaking, paper dress form for, (46) U.S.D.A. 792.
- Dried blood—
 - analyses and digestibility, (45) 468.
 - as milk substitute for calves, (42) 471.
 - availability as affected by soil, N.J. (41) 22; (44) 322; (46) 519.
 - availability, factors affecting, (48) N.J. 325.
 - carbon dioxid and ammonia formation from, (41) 421.
 - effect on availability of rock phosphate, (46) Ohio 429.
 - effect on lime requirements, (44) Pa. 723.
 - effect on nitrogen fixing power of soil, (50) 119.
 - effect on soil acidity, (42) 816; (47) R.I. 519.
 - effect on soil reaction, (46) 211.
 - feeding value, (42) 769; (45) 377.
 - fertilizing value, (41) Mass. 21, N.C. 625; (42) 22, Calif. 812; (43) Wis. 336, 627, Can. 727; (44) 513; (47) Mo. 141, 819; (48) 219; (50) 624.
 - Krause process, (42) 161.
 - nitrifiability, (46) 516.
 - nitrification, (43) 215; (44) 24.
 - value on cranberries, (45) N.J. 216.
- Driers—
 - construction, (49) U.S.D.A. 411.
 - for corn dehydration, (47) 206.
 - recirculation, (49) Oreg. 388.

Driers—Continued.

vegetable and fruit, construction, (42) U.S.D.A. 114.

Drill press, post, use, (43) 483.

Drills, manufacture and use, (44) U.S.D.A. 85.

Drosera rotundifoli, glandular secretion, acidity, (49) 520.

Drosophila—

as affected by temperature, (41) 868.
breeding experiments, (41) 867, 868; (42) 767.

duration of life, (46) 661; (47) 864; (49) 568; (50) 824.

duration of life, effect of density of population, (48) 471.

duration of life, effect of etherization (48) 166.

duration of life, inheritance, (49) 667.

effect of selection for eye facet number, (48) 367.

factors for notch in, (41) 175.

flies as pest and disease carriers, (44) Minn. 753.

heterozygous, ommatidial number, temperature factors, (49) 266.

hydei, eyeless mutant in, (48) 764.

hydei, inheritance of two sex-linked characters, (49) 368.

in bottled certified milk, (41) 57.

interaction between closely linked lethals in, (48) 469; (49) 770.

melanogaster—

complete linkage in, (48) 166.
effect of selection on Mendelian ratio of eye and eyeless, (49) 769.

eggs as affected by X-rays, (46) 673; (47) 67.

inheritance of eye color in, (47) 569.

inheritance of ski wings in, (48) 765.

linkage in, (44) 174.

mutant type, (47) 172.

new mutations in an inbred strain, (49) 770.

noncrisscross inheritance in, (48) 165.

reverse mutation in, (50) 331.

sex ratios in, (50) 530.

mutant genes, revised map, (47) 667.

obscura, linkage relation of sex-linked characters in, (48) 764.

reproduction, effect of density of population, (48) 367.

types of chromosome groups, (50) 528.

vitamin requirements, (47) 565.

willistoni, sex-linked mutant characters, (48) 166.

Drosophilinae, North American, (45) 857.

Drought—

and means of combating in Volga region, (48) 809.

effect on critical periods of plant growth, (43) 207.

in California, (43) U.S.D.A. 511.

Drought—Continued.

in Italy during 1921, (48) 809.

in Kansas, (42) 509.

in Russia in 1921, (49) 209.

Investigation Commission, Union of South Africa, (49) 192.

of 1921 at Kew, (46) 712.

periods and climatic cycles, (46) 209; (47) U.S.D.A. 414, 628.

relation to production, (49) 808.

studies, (50) 13.

Droughts—

Australian, relation to air currents, U.S.D.A. (42) 618, 620.

forecasting, (49) 509.

in Great Britain, (45) 512, 808.

on California coast, laws controlling, (47) 810.

probable, method of constructing diagram, (43) 319.

tropical, relation to sun spots, (44) U.S.D.A. 415.

warm season, (41) U.S.D.A. 809.

Drug—

analysis, synthetic, studies, (45) 806. and aromatic plant production, (46) 41.

and food manual, (43) U.S.D.A. 164.

plant industry in Germany, (45) 743.

plants—

breeding experiments, (42) 443.

culture, (41) 339; (43) 838; (45) 239, 643.

culture in Argentina, (43) 746.

culture in France, (43) 746.

culture in United States, (41) 837.

culture, manual, (42) 538.

history and folklore concerning, (50) 140.

in Crimea, insect enemies, (47) 53.

nomenclature, (42) 43.

of Germany, (41) 743.

of Philippines, (48) 842.

present and potential production in French colonies, (49) 389.

report, (47) 314.

sources and uses, (48) 239.

unexploited source of supply, (43) 41.

products, analyses, (47) Me. 764.

products, inspection, (47) Conn.State 559.

Drugs—

analyses, (43) Me. 662, Conn.State 859.

analysis, methods, (41) 412, 710.

analysis, official method, (44) 9.

chemical nature, (50) 880.

chemistry and analysis, treatise, (45) 207.

crude, drying, (46) U.S.D.A. 208.

detecting adulteration, (41) 429.

distribution between immiscible solvents, (47) 15.

effect on hemoglobin regeneration, (45) 862.

effect on milk fat production, (47) 278.

Drugs—Continued.

- effect on milk production, (41) 181; (43) 577.
 - examination under pure food law, (46) 60.
 - for treatment of nuttalliosis, (44) 82
 - inspection, (47) Conn.State 170, Me. 171; (50) Me. 58.
 - inspection and analysis, (45) Conn. State 365.
 - microscopic examination, manual, (49) 12.
 - molds in, detection, (47) 314.
 - new and nonofficial, (41) 781.
 - notes, (41) N.Dak. 763.
 - organic, standardization, (44) 111.
 - pests of, (45) 657.
 - proprietary preparations, analyses, (43) N.Dak. 368.
 - use to stimulate milk production, (49) Iowa 779.
 - useful, handbook, (43) 580.
 - vegetable, origin and history, (47) 333.
- Drumlins, mapping, (49) 616.
- Dry bible, notes, (48) 181.
- Dry cells, electrical characteristics and testing, (49) 184.
- Dry farm crops, treatise, (42) 437.
- Dry farming—
- at Scottsbluff Substation, (49) Nebr. 527.
 - climatic conditions controlling, (41) U.S.D.A. 417.
 - experiments, (41) Idaho 226, Ariz. 332; (43) Mont. 332; (44) Oreg. 826; (46) U.S.D.A. 724; (47) N.Mex. 333.
 - experiments in Africa, (46) 227.
 - experiments in Egypt, (46) 816.
 - experiments in South Africa, (41) 528.
 - in Arizona, (41) Ariz. 29.
 - in Canada, (45) 630.
 - in northern Africa, (44) 508.
 - in South Dakota, (44) U.S.D.A. 227.
 - methods, (41) U.S.D.A. 442.
 - research, phytometer method, (41) 327.
 - rotations and cultural methods, (41) Mont. 29.
 - tillage experiments, (46) Wash. 216.

Drying—

- apparatus, laboratory, (41) 311.
- effect on legume bacteria, (47) 216.
- industrial, treatise, (41) 618.
- industry in Germany, (42) 417.
- of foods, (45) 415, 616; (47) 263.
- of foods—*see also* Fruits and Vegetables,
 - and feeding stuffs, (43) 15.
 - bacteriological aspects, (43) 316.
 - bibliography, (41) 557.
 - commercial, (42) 211.
 - in the home, (44) 461.
 - low-temperature vacuum process, (41) 807.
 - new methods, (42) 507.

Drying—Continued.

- of foods—continued.
 - standards for, (43) 368.
 - work of Bureau of Chemistry, (44) 810.
 - of fruits, (43) Wash. 715; (48) Calif. 506, Calif. 507.
 - of fruits and vegetables, (43) Can. 316; (50) 97.
 - of fruits in California, (48) 13.
 - of grapes, (43) Calif. 715.
 - of soils, effect on hydrogen-ion concentration, (47) 619.
 - symposium on, (46) 11.
- Dryopeia hirsuta n.sp., description, (45) 860.
- Dryopeia morrisoni n.sp., description, (41) 255.
- Drypta australis attacking sugar cane leafhopper, (44) 550.
- Drypta australis, notes, (45) 551.
- Duck and goose hybrid, characters, (47) 570.
- Duck disease, toxic anaerobe from, (49) 382.
- Ducklings, disease of, (42) 779.
- Ducks—
- American shoal-water, food habits, (44) U.S.D.A. 547.
 - calcium metabolism, (43) N.Y.State 574.
 - cost of rearing, (50) Can. 473.
 - digestion and nitrogen-balance trials, (46) 173.
 - egg production, effect of protein feeds, (45) 576.
 - feeding, (47) 377.
 - feeding experiments, (50) Can. 777.
 - feeds and feeding, (41) Can. 370.
 - hybridization, (47) 667.
 - interstitial cells in, (42) 668.
 - natural history, treatise, (50) 355.
 - North American, life histories, (49) 756.
 - raising, (42) 563; (45) 474; (47) N.J. 673.
 - raising, feed costs, (50) Can. 778.
 - raising in Argentina, (49) 171.
 - raising, treatise, (48) 768.
 - respiration, (48) 680.
 - respiration calorimeter experiments, (46) 172.
 - runner, breeding and management, (42) 562.
 - Scottish breeding, arrival and dispersal, (48) 150.
 - spontaneous disease of, (49) 684.
 - summer plumage of, (42) 68.
 - trap nesting, (49) 374.
 - trematode parasites of, (49) 183.
 - weights and measurements, (44) 572.
 - wild, and foods of Bear River marshes, (45) U.S.D.A. 250.
 - wild, migratory movements, (49) U.S.D.A. 351.

Ducks—Continued.

- wild, of Nebraska, and their food plants, (43) U.S.D.A. 50.
- Duff moisture conditions and forest fires, (50) 544.
- Duhat, vitamin content, (46) 667.
- Dune sand as substratum for root growth, (42) 728.
- Dunes, sand, forestation methods, (43) 651.
- Dunziekte in horses, (44) 76.
- Duodenal regurgitation during gastric digestion, (47) 264.
- Duodenum, H-ion concentration of, (42) 553.
- Duomitus ceramicus, notes, (43) 450; (47) 856.

Durra—

- asal fly in Sudan, (41) 664.
- brewing tests and utilization, (41) 641.
- disease, notes, (45) 843.
- disease survey in India, (46) 544.
- flour, characteristics and detection, (41) 467.
- kernel smut resistance, (41) Kans. 48.
- straw, analyses and feeding value, (45) 376.

Dust—

- collecting fans for threshing machines, (43) U.S.D.A. 390.
- copper, (41) 354.
- copper-arsenic, value, (46) 846.
- explosion, lower limits of concentration for, (50) 688.
- explosion prevention, progress, (47) 592.
- explosions—
 - cause and prevention, (45) 184.
 - from unprotected electric lights, (45) U.S.D.A. 291.
 - papers on, (44) 587.
 - treatise, (48) 90.
- fungicides for control of smut, (44) 343.
- grain, explosions and fires, prevention, (42) 284.
- insecticides in California, (46) 852.
- mixtures for insect control, (45) 253.
- schedule, (45) 45.

Dustfall of March 19, 1920, (47) 510.

Dusting—*see also* Spraying and specific plants.

- and spraying, (45) 44, 345, 454; (47) N.Y.State 157.
- and spraying for citrus pests, (49) 654.
- and the spray gun, (44) 253.
- experiments, (41) Ill. 146, 153, 340, 348, Ill. 750, 755; (42) 541, 551; (43) 842; (44) Mich. 144; (47) 55.
- experiments for cabbage worm, (48) 52.
- for control of sucking insects, (47) 52.
- for fruit diseases and pests, (46) 448.
- for pear thrips, (44) 853.

Dusting—Continued.

- household, increase in metabolism during, (42) 167.
- machine, experiments, (46) 854.
- machine, self-mixing, (49) Calif. 287; (50) 52.
- machines for boll weevil control, U.S.D.A. (42) 786; (49) 558.
- summary, (45) 439.
- v. spraying, (42) 544, 637; (43) 238, 255, Ind. 338, Ohio 340, 352; (44) 155, Oreg. 160, 243, Minn. 745; (45) Ind. 134, 137, Miss. 138, Conn.State 148, Mich. 235, 253, 552; (46) 52, 845; (47) 53, Ind. 139, Conn.State 140, Mich. 439, 750; (49) 442; (50) 446, Can. 643.
- v. spraying—
 - for celery blight, (50) 651.
 - for pear psylla, (49) N.Y.State 52.
 - for potato blight, (49) R.I. 544.
 - for Quebec orchards, (42) 748; (44) 52.
 - for red bugs, N.Y.State (47) 157, 453.
 - in Hawaii, (50) 356.
 - results, (49) Conn.State 534.
 - value, (47) Minn. 348.
 - vegetable crops, Va.Truck (47) 236; (49) 233.
- Dusts, explosive, in air, collection and examination, (49) 387.
- Duty of water, *see* Irrigation water, duty of.
- Dwarf, metabolism of, (43) 368.
- Dye intermediates, decolorization, (47) 411.
- Dye therapy for streptococcus empyema, (44) 680.
- Dyeing, review and bibliography, (41) 801.
- Dyes—
 - acid, adsorption by activated sugar charcoal, (49) 505.
 - bactericidal action on calf lymph, (47) 483.
 - chemistry of, progress, (41) 613.
 - coal-far, classification and identification, (45) 508.
 - foreign, detection of Yellow AB and Yellow OB in, (44) 312.
 - from waste sulphite liquor, (42) 615.
 - isocyanin, from lepidin, (44) 504.
 - natural, of Philippines, (48) 842.
 - natural, treatise, (41) 110.
 - photosensitizing, new series, (44) 802.
 - photosensitizing, production, (43) 14.
 - photosensitizing, synthesis, (44) 504.
 - sources and uses, (48) 239.
 - spectral transmissive properties, (50) 714.
 - tests of plants for, (46) 227.
 - vegetable, of New Zealand, (41) 710.
- Dynamite as affected by soil moisture, (42) Wis. 384; (43) U.S.D.A. 282.
- Dynamite, use in agriculture, (43) 480.

- Dynamite v. horsepower for land clearing, (42) Minn. 888.
- Dynamite v. horsepower for stump removal (43) Minn. 888.
- Dynamiting for swamp drainage, (41) 482.
- Dynamiting rocky soils, (41) 624.
- Dynamometer—
 new, description, (42) 283.
 portable recording, description, (50) 588.
 recording, for tractors, (47) 592.
- Dynamometers—
 for tractors, (46) 491.
 hydraulic and spring, (46) 585.
 rotation, description, (46) 890.
- Dynastinae of British India, descriptions, (43) 50.
- Dyscerus n.spp., descriptions, (43) 163.
- Dyscinetus trachypygus on sugar cane, (42) 52.
- Dysdercus—
 albdiventris, notes, (42) Ariz. 357.
 andreae, notes, (45) V.I. 150.
 delauneyi, life history and control, (42) 851.
 sidae, notes, (49) 758.
 spp., notes, (41) 251, 455.
 superstitiosus, life history and habits, (50) 755.
 suturellus, *see* Cotton stainer.
- Dysentery—
 bacillary, immunization, oral route for, (50) 478.
 bacillary, in lambs, (46) 776.
 bacillary, in lambs, etiology and source of infection, (49) 682.
 bacilli, viability in excrement, (46) 588.
 chronic bacterial, *see* John's disease.
 prophylaxis and treatment, (41) 577.
- Eantis thraso, notes, (43) 556.
- Ear tick—
 disease, review of literature, (49) 455.
 disease, studies, (49) 157.
 spinose, suppression, (46) 661.
- Earias—
 insulana, notes, (47) 254.
 insulana, parasite of, (47) 358.
 spp., notes, (47) 256, 357; (48) 550.
- Earth—
 burnt, as substitute for stone in concrete, (42) 586.
 excavation, estimation, (42) U.S.D.A. 83.
 pressure, lateral, determination, (49) 484.
 pressures, measurement, (41) 482, 582, 790.
 pressures, theory of, (42) 384.
- Earthenware—
 pots, source of error in experiments, (50) 617.
 soluble lead in glaze of, (42) 164.
- Earthquake in Virginia, (42) U.S.D.A. 620.
- Earthwork and its costs, (43) 589.
- Earthworms, effect of soil reaction, (49) 213.
- Earthworms, rôle in transmission of gapes, (43) Md. 586.
- Earwigs—
 as horticultural menace, (50) 153.
 control, (48) Fla. 251, Oreg. 253.
 European, control, (49) West.Wash. 850.
 European, poison baits for, (49) 850.
 food plants of, (44) 754.
 on pear leaves, (45) 552.
 studies, (42) 851.
- East coast fever, *see* African coast fever.
- Eating utensils, machine-washed v. hand-washed, (43) 261.
- Eccentric, driving or driven elements, (42) 83.
- Eccoptogaster rugulosus, notes, (50) 449.
- Echeveria carunculata, leaf nodosities, (49) 820.
- Echidnophaga gallinacea, notes, (49) 356; (50) 55.
- Echinacea therapy, experimental study, (44) 275.
- Echinochloa, revision, (44) 327.
- Echinococcosis, serum diagnosis, (46) 276.
- Echinodontium tinctorium—
 enzym activities in, (48) 328.
 on blazed trees, (46) 151.
- Echinostomum revolutum, life history, (49) 183.
- Echium plantagineum, feeding experiments, (48) 168.
- Ecologic diversity and generic coefficients, (44) 133.
- Ecological investigations, effect of temperature discrepancies, (42) N.Y.State 316.
- Ecology—
 agricultural, (47) U.S.D.A. 413.
 in Natal, (47) 525.
 of Big Stone and Lake Traverse region, (46) 222.
 of plants, (45) 336.
 of root systems, (41) 327.
 of Santa Lucia Mountains, (46) 26.
 of strand vegetation, (46) 27.
 of Tilia americana, (43) 223.
 of tropical rain forests, (43) 241.
 plant, of Kansas sand hills, (43) 731.
 plant, studies, (41) 327; (49) 28.
 quadrant method of study, (43) 223.
- Economic—
 and commercial prospects of Italy, yearbook, (49) 693.
 and financial conditions—
 in Austria, (48) 495.
 in British West Indies, (48) 495.
 in Canary Islands, (48) 495.
 in Greece, (48) 495.
 in Honduras, (48) 495.
 in Japan, (48) 495.
 in Mexico, (48) 494.
 in Serb-Croat-Slovene Kingdom, (48) 495.

Economic—Continued.

- conditions in Deccan Canal areas, (43) 94.
- conditions in Italy, (48) 894.
- conditions in Philippines, treatise, (46) 895.
- conditions in Russia, (49) 693.
- developments in Russia, (48) 791.
- resources of new States of Europe, (47) 297.

Economics—

- and the community, (47) 598.
- home, *see* Home economics.
- rural, *see* Rural economics.

Economy, national, principles, treatise, (46) 590.

Ecpnylus hicoriae n.sp., description, (41) 463.

Eczema in breast-fed infants, (47) 370.

Eddoes, culture experiments, (41) 825.

Eddoes, variety tests, (46) 226.

Edema—

- as symptom in food-deficiency diseases, (42) 760.
- cause, (45) 569.
- deficiency, notes, (44) 262.
- in monkey, observations, (42) 365.
- in Turkish prisoners of war, studies, (43) 66.
- malignant, in swine, (43) 385.
- of eyelids caused by ants, (41) 463.
- parturient malignant, (48) Calif. 579.
- relation to protein deficiency, (42) 557, 865.
- war, importance of proteins in, (44) 465.
- war, relation to deficiency diseases, (42) 864; (45) 569.

Edessa—

- meditabunda, life history and control, (42) 851.
- meditabunda, notes, (41) 251.
- offinis, notes, (49) 550.

Edestin—

- colloidal behavior, (47) 711.
- effect on milk secretion, (47) 365.
- new sulphur-containing amino acid from, (49) 714.
- nutritive value, (47) 660.
- pepsin digestion of, (42) 165.
- use in determining proteolytic strength of pepsin, (45) 504.

Education—

- agricultural, *see* Agricultural education.
- in Africa, (48) 496.
- vocational, *see* Vocational education.

Educational—

- extension, (49) 796.
- forces, correlation, (50) 895.
- surveys, (49) 796.

Eels, zinc in muscle tissue, (47) 564.

Eelworms, parasitism of, (43) 350.

Egg—

- albumin, *see* Albumin, egg.
- breakers, use in frozen-egg plant, directions, (42) U.S.D.A. 770.

Egg—Continued.

- by-products from hatcheries, utilization, (49) Ohio 373.
- characters, studies, (43) N.Y.Cornell 872.
- content of food materials, determination, (45) 13.
- embryo, relation to axis of symmetry, (42) 559.
- market, fluctuations in, (43) 73.
- ovens in Egypt, (42) 69.
- pack, maintaining standard, (45) Wash. 776.
- packing, discussion, (43) 873.
- powder, composition, (46) 204.
- production—*see also* Hens, laying.
 - and body characters, (47) Tex. 869.
 - and body temperature, (50) 872.
 - and feeding, monthly standards, (47) N.J. 276.
 - and trade, (49) 376.
- production as affected by—
 - age of hen, (41) Ark. 571.
 - artificial light, (41) N.J. 572, 869, Wash. 871; (44) Mont. 368; (45) 71; (46) N.Mex. 370, N.J. 574, 678, 875; (47) N.Mex. 475, N.C. 577; (48) Mich. 373, N.J. 373, Calif. 667; (49) Can. 71, Okla. 470, Ind. 573, Ky. 574.
 - confinement, (41) Ind. 570.
 - feed, (46) Iowa 363, Mo. 370, 770.
 - hatching date, (41) N.J. 75.
 - illumination, (42) Calif. 871.
 - pituitary feeding, (44) 368; (50) 275.
 - rations of chicks, (43) Ky. 72.
- production—
 - beef scrap v. skim milk for, (50) Can. 373.
 - breeding for, (43) Mich. 674, Can. 776.
 - by hens and pullets, (50) Can. 471.
 - changes in, Mass. (48) 574; (50) 577.
 - cost accounts, (48) N.J. 667.
 - cost and profits, (47) Miss. 73.
 - costs, (46) N.J. 574; (50) Can. 779, N.J. 872.
 - effect of vitamin B on, (50) Pa. 473.
 - egg weight as criterion, (41) 274; (42) 770.
 - factors affecting, (45) 70; (48) Mo. 666.
 - feed cost, (42) Tex. 376.
 - feeding for, (43) 174, Idaho 269, N.Mex. 378, Mo. 776; (47) 377; (48) Ohio 667; (49) Mo. 574; (50) Ill. 373.
 - first and second year, correlation, (48) 667.
 - formula for pullet year, (45) 70.
 - genetics of, (46) 876.

Egg—Continued.

production—continued.

hens v. pullets, (47) Minn. 378.
 home-grown v. commercial feeds
 for, (50) 273.
 improvement by breeding, Kans.
 (41) 76; (42) 873.
 improving, (49) Mont. 171.
 in Rhode Island Reds, internal
 factors, (41) 179.
 increase in winter, (42) 268.
 inheritance of, (42) 872, Mass.
 872, 873.
 judging for, (42) N.J. 376.
 monthly and yearly, correlation.
 (48) 575.
 monthly and yearly records for
 pullet year, (48) 476.
 monthly distribution, relative
 value, (49) 674.
 of dams and daughters, correla-
 tion coefficients, (50) 275.
 of Ireland, (47) 673.
 of pullets and hens, (50) Can. 372.
 of various periods and of year,
 (47) 672.
 pedigree basis of selecting breed-
 ing males for, (49) 873.
 predicting, (46) 575.
 protein feeds for, (47) Miss. 73,
 Idaho 779, Idaho 870, 871.
 record, annual, correlation with
 sexual maturity, (50) 577.
 records, errors incident to use,
 (41) N.J. 75.
 records, lessons from, (50) N.J.
 72.
 records, method of indicating time
 element, (41) 870.
 records, prediction, (50) N.J. 779
 relation to blood fat, (41) 773.
 774.
 relation to body measurements,
 (41) 370.
 relation to food, (49) 171.
 relation to keel bone, (46) 770.
 relation to molting, (47) West.
 Wash. 577.
 relation to stage of senescence,
 (50) 577.
 rôle of protein in, (43) Ky. 871.
 second year's, calculating, (48)
 76.
 selection of rations, (42) Ohio
 397.
 slumps, overcoming, (47) Wash.
 196.
 summer, maintaining, (47) N.J.
 476.
 time of molting as index, (48)
 Mo. 666.
 value of animal protein for, (46)
 Ky. 875.
 wet v. dry mash for, (49) 171.
 winter, (44) 870.
 winter cycle, (48) 477.

Egg—Continued.

production—continued.

winter, relation to year's record,
 (41) 370.
 products, frozen, analyses, (43)
 U.S.D.A. 414.
 protein in human milk, (46) 564.
 shell formation, calcium in, (47) 576.
 shells, thin, causes, (46) 267.
 substitutes, analyses, (42) 162.
 substitutes, baking experiments, (42)
 58.
 substitutes, so-called, (41) N.Dak. 66.
 weights, factors affecting, (50) W.Va.
 675.
 yolk, antirachitic value, (50) 165, 166.
 yolk formation, (46) 173.
 yolk media, unheated, (41) 63.
 Egg-laying contest, (42) Wash. 599; (43)
 Wash. 798; (44) Wash. 572; (45) Ariz.
 877; (46) Wash. 478; (47) N.Mex. 476;
 (48) N.Dak. 76, West.Wash. 498.
 Egg-laying—
 contest in—
 Australia, (43) 674, 873.
 Connecticut, (47) 176.
 Ireland, (46) 73.
 New Jersey, N.J. (42) 470; (43)
 173, 468.
 New South Wales, (46) 273; (48)
 172.
 New York, (47) 176.
 Tasmania, (47) 673.
 Texas, (42) Tex. 376; (47) 672.
 western Washington, (47) 672;
 (50) West.Wash. 598.
 ccntest of Santa Cruz Farm Bureau.
 (47) Calif. 672.
 contest, summary, (47) Ark. 779.
 contest, value to poultry industry, (46)
 770.
 contests, (41) N.J. 76, Nebr. 370,
 Conn.Storrs 870; (46) N.J. 877;
 (48) N.J. 576; (50) N.J. 473.
 contests in Australia, (41) 370, 371,
 870; (42) 874.
 contests in Canada, (47) 673.
 contests in England, (41) 370; (45)
 172, 173.
 contests in New Jersey, (47) 176.
 Eggplant—
 blight, (44) La. 844.
 Cercospora leaf spot, notes, (50) 748.
 collar rot, notes, (50) 244.
 disease, (46) Mass. 43.
 diseases, (41) 745; (42) 148.
 diseases, control, (44) N.J. 341.
 fruit spot, notes, (41) Fla. 543.
 leaf miner, studies, (50) 847.
 rot, studies, (41) Fla. 542.
 stocks, potato grafted on, (47) 28.
 sun-dried; vitamin content, (46) 359.
 wilt, cause, (49) 648.
 wilt, notes, (46) 43, 844; (48) N.J.
 345, N.J. 347.

Eggplants—

- breeding experiments, (41) N.J. 43;
(50) P.R. 540.
- culture experiments, (48) V.I. 340.
- hardening process in, (46) Mo. 827.
- manuring experiments, (50) R.I. 35.
- root development, (43) 834.
- spraying, (49) Va.Truck 233.
- yield as affected by irrigation, (50)
Mo. 15.

Eggs—

- air cell in, measurements, (46) N.J.
574.
- analyses, (45) Can. 877.
- and egg products, analysis, (48) 807.
- and products, inspection and analysis,
(45) Conn.State 365.
- as source of vitamin B, (49) 161.
- candling, (41) 361; (46) Mont. 273.
- candling devices, (42) U.S.D.A. 268.
- catalase content, (42) 768.
- chilled, incubation, (49) Can. 70.
- cold storage, U.S.D.A. (41) 66, 179;
(49) 893.
- composition and hatching ability, (47)
378.
- composition, effect of calcium, (46)
876.
- cost of production, (42) N.J. 770.
- defects in, revealed by candling, (42)
U.S.D.A. 268.
- dehydration, (41) 557.
- desiccated, use, (44) 661.
- distribution to school children, (41)
396.
- dried, bacteriological analyses, (46)
Mich. 466.
- dried, industry in China, (49) 507.
- early laying, economic significance.
(49) 674.
- effect of age on hatching quality, (43)
Md. 575.
- electrical hatching, (42) 687.
- embryo mortality, (41) N.J. 75.
- establishing type and size, (46) 876.
- exports from Orkney Islands, (43)
174.
- exports from South Africa, (43) 676.
- fertility and hatchability, (50) Can.
472.
- fertilization, (41) 774, 871.
- from early v. late hatched chicks, (50)
Can. 273.
- gastric response to, (41) 857.
- graded, culinary value, (50) 161.
- grading, device for, (44) Wash. 368.
- grading, handling, and packing, (41)
N.J. 572.
- handling and grading, (49) 273.
- hard-boiled, ferrous sulphid formation
in, (43) 458.
- hatchability—
 - and chick mortality, (46) 769.
 - and number, factors affecting,
(48) W.Va. 172.

Eggs—Continued.

- hatchability—continued.
 - as affected by rations, (44) Ohio
368; (49) Kans. 470; Wis. 672.
 - effect of time of year, (50)
Can. 373.
 - factors affecting, (47) N.C. 577,
Conn.Storrs 779.
 - relation to *Bacterium pullorum*,
(50) 685.
- hatching—
 - experiments, (50) Can. 778.
 - from hens v. pullets, (50) Can.
473.
 - percentages, effect of moisture
during incubation, (44) N.J.
369.
 - percentages in different months,
(50) Can. 778.
 - in cold storage, effect of ventilation,
(50) 873.
 - in food pastes, determination, (47)
611.
 - incubated, turning experiments, (46)
N.J. 574; (47) Minn. 378, 869.
 - incubation, (41) N.J. 77, 371; (44)
Conn.Storrs 572; (47) Wash. 196,
Calif. 276; (48) 477; (49) N.J. 273;
(50) Mo. 873.
 - incubation—
 - artificial v. natural, (42) Minn.
886; (48) 477; (50) U.S.D.A.
174.
 - effect of abnormal temperatures,
(42) 669.
 - importance of humidity, (47) N.
Mex. 475.
 - in Egypt, (42) 69.
 - methods, (50) 273.
 - natural, (44) U.S.D.A. 270.
 - period, variation in, (46) Guam
764.
 - systems, comparison, (50) Can.
778.
 - temperature experiments, Ind.
(47) 176; (49) 573; (50) 374.
 - infertile market, value, (50) Mo. 872.
 - liquid, boric acid determination in,
(50) 805.
 - loss in weight during incubation, (50)
Can. 472.
 - loss of weight, effect of size, (50) 374.
 - loss of weight, physical basis, (50)
577.
 - loss of weight, variation in, (48) 768.
 - lying in water, incubating, (50) 873.
 - market before and after the war, (44)
871.
 - market, crating, (44) 270, N.J. 270.
 - marketing, (44) 887; (45) 878.
 - marketing in Indiana, (50) 873.
 - marketing in New York City, (43)
174.
 - methods of investigation and stand-
ards, (41) 558.

Eggs—Continued.

- New York City prices, effect on poultry raisers, (49) N.J. 172.
 of parasitic worms, detection in animal feces, (49) 785.
 organisms pathogenic for developing embryo in, (48) 883.
 packing crates on cars, (42) U.S.D.A. 376.
 physical qualities, effect on fertility and hatching power, (47) Nebr. 780.
 premature, method of obtaining, (46) 769.
 preparation for market, (42) 671.
 preservation, (41) N.J. 75; (42) 212, U.S.D.A. 254, 616; (44) U.S.D.A. 270; (45) 474, Can. 877; (46) 877; (49) Mont. 471, Mont. 874; (50) Can. 472.
 preservation, use of water glass in, (50) 615.
 preserved, Chinese, (41) 858.
 prices and cold storage holdings, (49) N.J. 794.
 prices and quality on New York market, (43) 174.
 prices in New York, (41) N.J. 75.
 producing, handling, and packing, (46) N.J. 273.
 project study outlines, (44) 596.
 pullets, size in relation to age, (47) 672.
 rare anomaly of, (43) 73.
 recipes, (42) U.S.D.A. 254.
 sex indicator, value, (47) 577.
 shrinkage in storage, prevention, (47) 869.
 size, relation to average production, (45) 172.
 size, relation to chick weight, (47) 672.
 soft-shelled, prevention, (42) Wis. 376.
 specific gravity, effect on fertility and hatching power, (49) 373.
 stored, cottonseed meal spots on, (44) Calif. 774.
 studies, (49) Idaho 777.
 surface area, calculating, (49) 274.
 trolley carriers, (41) Wash. 292.
 two-embryo, of the ring dove, (41) 867.
 unturned, position of yolks, (43) 675.
 value of wrapping, (48) N.J. 373.
 vitamin content relation to feed, (46) Kans. 478.
 weight, inheritance of, (43) 674.
 weight, normal distribution, (43) R.I. 674.
 winter production, (49) Ohio 273.
 winter production, effect on fertility and hatchability, (50) Can. 471.
 wrapping in tinfoil, (47) Md. 73.
 zinc in, (41) 464; (47) 564.
 Ehrhornia cupressi, studies, (43) U.S.D.A. 452.

Eimeria—

- brumpti n.sp., notes, (49) 182.
 canadensis n.sp., description, (45) 886.
 pfeifferi in pigeons, (46) 886.
 sp. infecting rabbits, (41) 784.

Einkorn—

- as affected by Hessian fly, (41) Kans. 34.
 early growth in alkali soil, (42) Utah 28.

Elachista n.spp., descriptions, (43) 55.

Elachista spp., notes, (43) 55.

Elaphidion inerme, notes, (43) 851.

Elaphidion villosum, notes, (50) 449.

Elasmus albomaculatus, parasitism by, (45) 663.

Elatotrypes hoferi n.g. and n.sp., notes, (41) 259.

Elder, box, culture experiments, (48) N.Dak. 239.

Elder, European, (41) 653.

Elderberries, oil from, analysis, (42) 410.

Eleagnus, bud variation in, (47) 326.

Elecampane, inulin in, (42) 226.

Electric—

arc nitrification, studies, (43) 323.

current from traction lines, leakage into soils, (43) 625.

light and power from small streams, (41) U.S.D.A. 690.

light and power plant, farm, (44) 486.

light, effect on plant growth, (47) 327.

motors, fees and tests, (46) 491.

oven for rapid moisture tests, (45) 313.

power for milking plants, (47) 792.

power systems of California, (49) 383.

pumping tests and service records, (42) 182.

range handbook, (49) 589.

vehicles, tests, (43) 484.

Electrical—

charges of colloidal particles and plant tissue, origin, (47) 424.

conductivity of ligneous and herbaceous plants, (47) 327; (49) 26.

cultivation, new system, (50) 388.

engineering, standard handbook, (49) 483.

power in France, (43) 790.

Electricity—

application to crop production, (45) 734.

application to household and farm, (50) 388.

effect on plant growth, (46) Ky. 830.

for commercial cooking, (50) 58.

for cooking, (41) 587.

for farms, conditions of supplying, (50) 486.

for heating, (41) 587.

from central stations, use on the farm, (48) 197.

in agriculture, (43) 285.

Electricity—Continued.

- in agriculture, treatise, (49) 589.
- in American homes, (44) 589.
- in German agriculture, (50) 88.
- in rural districts of France, (42) 592.
- on Kansas farms, (42) 591.
- on the farm, (41) 489; (43) U.S.D.A. 486; (48) 888.
- on the farm, bibliography, (50) 287.
- on the farm, cost, (45) Mich. 690.
- on the farm, papers on, (50) 98.
- rural distribution, (48) 384.
- static, in attrition mills, (44) 587.
- Swoope's lessons in, (49) 286.
- v. steam power for dairy operation, (49) 84, 85.

Electroculture, (42) 136; (44) 137; (49) 224.

Electroculture—

- in France, (50) 131.
 - in Great Britain, (50) 131.
 - investigations, review, (42) 38.
 - studies, (48) Can. 450.
- Electrode, titration, description, (41) 765.
- Electrodes of platinized glass, (43) 612.
- Electrolysis in concrete, (42) 281.

Electrolytes—

- concentration, effect on diffusion rate of water, (46) 126.
 - effect on ammonia absorption, (50) 722.
 - effect on plant membranes, (42) 130.
 - in leaf sap, concentration, (43) 633.
- Electrolytic apparatus, platinum substitute for, (41) 204.

Electrometric titration—

- notes, (41) 503, 711.
- of amino acids, method, (42) 612.
- of protein solutions, (41) N.Y.State 201.

Electromotive forces, pH, H⁺ and OH⁻ values corresponding to, (41) 204.

Electrons in chemistry, treatise, (50) 608.

Electro-osmotic phenomena in plants, (45) 626.

Electrophysiology, studies, (43) 819.

Electroscope for measuring radioactivity of fertilizers, (49) 217.

Electrotitration apparatus for determining H-ion concentration, (47) 204.

Eleocharis spp., analyses, (41) Wyo. 333.

Elcodes—

- hispidabris, control, (49) Idaho 756.
- opaca, life history, (41) 260.
- opaca, studies, (49) Nebr. 658.
- suturalis, biology, (50) 849.
- tricostata, habits, (44) 753.
- tricostata, notes, (45) 159; (49) Ark. 554.

Elephant grass—

- analyses, (44) Ariz. 568.
- culture in Florida, (41) Fla. 37.
- pulping qualities, (45) 808.

Eleusine coracana, notes, (42) 35.

Eleusine coracana, smut affecting, (49) 839.

Elkutherodactylus spp., control of insects by, (44) 651.

Elevator—

- operators, Minneapolis terminal, (42) 392.
- screenings for fattening steers, (43) Can. 672.
- screenings, recleaned, for livestock, (43) Can. 868.

Elevators—

- and transporters of hay, (42) 589.
- concrete, design, (45) 792.
- construction and management, (42) 491.
- construction, relation to explosions, (44) 587.
- cost of operating, (42) N.Dak. 492.
- farm, design, (45) 791.
- farmers', in Ohio, (42) Ohio 492.
- grain, plans, (42) 787.
- pneumatic, theory and practice, (46) 689.
- terminal, State ownership, (45) 595.

Elfin forest of California, (49) 837.

Elis 5-cincta, life history, (42) 550.

Elis spp., parasites of white grubs, (42) 549.

Elk herds, national, (41) 56; (42) U.S.D.A. 354.

Elk tick, notes, (50) Minn. 153.

Elm—

- arricciament'o, description, (42) 450.
- as affected by chloropicrin, (45) 28.
- culture experiments, (48) N.Dak. 239.
- destruction by poison gases, (46) 829.
- foliage, injury from sprays, (47) Mass. 646.
- gummosis, (43) 449.
- leaf beetle, biology, (41) 59.
- leaf beetle, notes, (41) Conn.State 159.
- leaf beetle, parasite of, (47) 261.
- leaf spots, notes, (48) 850.
- sawfly leaf miner, notes, (41) 759.
- scale, European, distribution, (49) 758.
- scale, European, summary, (45) 553.
- scale, European, washing experiments, (44) 654.
- white, canker, (45) 752.

Elms, American, twig blight of, (50) 656.

Elodea canadensis—

- as silage plant, (41) 737.
- bud, cytological observations, (50) 125.

Elymus—

- macounii, analyses, (41) Wyo. 333.
- mollis as silage crop, (41) Alaska 30.

Elytroteinus subtruncatus, notes, (49) 56.

Embaphion muricatum, biology, (46) 354.

Embothrium wickhami, studies, (42) 349.

Embroidering, energy expenditure during, (44) 66.

Embryology—

- dictionary of scientific terms, (45) 299.
- of bird's eggs, (42) 559.
- of cattle, (44) 266.

- Embryonic development, relation to suckling, (41) 862.
- Embryos, degeneration and absorption, (42) 764.
- Emersonella lemae, notes, (50) 849.
- Emmer—
 as affected by Hessian fly, (41) Kans. 34.
 culture, (45) N.Dak. 734.
 culture experiments, (41) Nebr. 36, Ariz. 332; (47) U.S.D.A. 330; (50) Can. 231.
 field tests, (41) N.Dak. 824.
 growing with barley, (41) S.Dak. 435.
 stem rust, effect on different varieties, (48) Can. 450.
 varieties for Canada, (47) 823.
 variety tests, Minn. (42) 731, 826; (44) 330; (47) 332, 333.
 wheat nematode attacking, (43) 751.
 yields, (49) Pa. 223, Ohio 733.
- Emphysema—
 chronic, sequel to foot-and-mouth disease, (44) 376.
 enteromesenteric bullular, of pigs, (49) 284.
 pulmonary, of horses, blood findings in, (45) 386.
- Emphytus cinctipes, life history, (47) U.S.D.A. 59.
- Empoa rosae—see also Rose leafhopper.
 studies, (41) N.Y.State 252; (42) U.S.D.A. 358; (44) 653; (49) 654.
 use of trap for control, (45) 254.
- Empoasca—
 mali, see Apple leafhopper and Potato leafhopper.
 minuenda n.sp., description, (45) 360.
 minuenda, notes, (43) 255, 851.
 spp., studies, (42) U.S.D.A. 359.
 unicolor, studies, (41) N.Y.State 252, 848.
- Empusa—
 disease in flies, (42) 361.
 lecanii, notes, (48) U.S.D.A. 458.
 lecanii on green bug, (41) 59.
 muscae, overwintering, (46) 51.
 sphaerosperma, notes, (44) U.S.D.A. 555; (48) N.Y.Cornell 460.
- Empyema, streptococcus—
 prevention by immunization, (42) 778.
 therapy for, (44) 680.
- Emulsions and emulsification, theory, treatise, (49) 109.
- Enamel ware, acid tests, (41) 314.
- Encarsia pergandiella, notes, (48) Ky. 356.
- Encelia farinosa, seasonal changes in transpiration, (46) 26.
- Encephalitis—
 lethargica and botulism, differential diagnosis, (46) 262.
 of bovines, contagious, (47) 883.
- Encephalocoele of baby chicks, (49) N.C. 787.
- Encephalomyelitis, spontaneous, of rabbits, (48) 182.
- Enchytraeiden, humus, information, (44) 126.
- Encyrtaspis proximus n.sp., parasitism by, (44) 356.
- Encyrtidae—
 Hawaiian, (43) 662.
 Hawaiian, new genera and species, (48) 856.
 synopsis, (47) 363.
- Encyrtus barbatus, notes, (43) 662.
- Encyrtus infidus, notes, (43) 252.
- Endelus bakeri, description, (42) 855.
- Endelus calligraphus n.sp., description, (42) 855.
- Enderleinellus, new genus, (43) 453.
- Endive, aerial fertilization with carbon dioxid, (41) Vt. 833.
- Endive, effect on following crop, (44) R.I. 31.
- Endocalyx melanoxanthus, notes, (47) 547.
- Endocarditis—
 relation to blackleg, (46) 481.
 valvular, in man and animals, (49) 279.
- Endocrine glands—
 effect on body development, (45) 468; (46) 72.
 growth during hypofunction of, (45) 769.
 relation to heredity and development, (48) 67.
- Endocrine organs, monograph, (41) 172.
- Endocrinology—
 and metabolism, treatise, (48) 162.
 and secondary sex characters, (44) 468.
- Endolimax nana, notes, (49) 477.
- Endomyces vernalis, digestibility and use, (46) 68.
- Endophyllum sempervivi, spores, nuclei, (44) 133.
- Endosperm development and F₂ sterility in wheat, (50) Me. 27.
- Endothia parasitica—
 factors affecting growth, (44) 520.
 notes, (48) 352.
 toxicity of sodium chlorid toward, (44) 520.
- Endothine red, studies, (44) 222.
- Energy—
 available, recovery in fattening steers, (41) 769.
 exchange in man, (41) 563.
 expenditure—
 during walking, (47) 562.
 estimating by indirect calorimetry, (41) 172.
 in household work, (44) 66.
 in minor duties, (45) 671.
 of laborers, (43) 463; (45) 670; (46) 571, 572.
 of school children, (49) 762.
 of women in household work, (42) 167.
 of women workers, (41) 761, 856.

Energy—Continued.

- metabolism as affected by phlorizin, (41) 68.
- metabolism, law of surface area in, (46) 755.
- requirements of children, (43) 166.
- requirements of girls, (47) 364.
- requirements of man, biometric standards, (42) 167.
- requirements of nodule bacteria, (49) 812.
- solar, absorption by leaves, (42) 730.
- sources, coefficients of utilization, (44) 463.
- supply for cell growth, (43) 131.
- transformations and respiratory exchange, computing, (47) 666.
- utilization in relation to mineral metabolism, (41) 558.
- values and starch values, (43) 372.

Engine—

- cooling, principles of, (43) 88.
- design, paper on, (43) 890.
- lubricants, dilution by fuel, (45) 588.
- troubles, remedies, (42) 586.

Engineering—

- agricultural, *see* Agricultural engineering.
- automatic control of temperatures, (45) U.S.D.A. 291.
- civil, handbook, (42) 478.
- college executive, problems, (49) 492.
- construction, cost keeping and management, (46) 888.
- construction costs, handbook, (49) 184.
- construction, statically indeterminate, analysis, (42) 887.
- cost accounting, treatise, (46) 486.
- course, ideal, (49) 596.
- data sheets, (42) 487.
- dredging, treatise, (43) 887.
- economics, treatise, (49) 483.
- education, improvement, (49) 596.
- education in land-grant colleges, (50) 895.
- experiment station legislation, (43) 395.
- experiment station, organization, (49) 596.
- experiment stations at land-grant colleges, status, (49) 596.
- experiment stations, history, (49) 492.
- for land drainage, (43) 280.
- formulas, design of diagrams for, treatise, (50) 586.
- handbook, (43) 278.
- highway, handbook, (42) 279.
- highway, research projects in, (49) 184.
- highway, treatise, (45) 790.
- household, guide, (42) 274.
- hydraulic, fundamental basis of, (42) 571.
- in Wyoming, (49) 483.
- instruction, improving, (49) 492.
- irrigation, (42) 479.

Engineering—Continued.

- materials, physical properties, (46) 688.
 - on the farm, treatise, (49) 482.
 - research, (47) 87; (50) 96.
 - research, progress in, (49) 492.
 - rural, applied to colonies, (46) 886.
 - sanitary, present status, (50) 590.
 - State, in Colorado, (49) 383.
 - State, in Wyoming, (45) 687.
 - structural drafting and design, (46) 888.
 - structural, handbook, (42) 486.
 - structures, structural members and connections, treatise, (50) 286.
 - sunlight, for detached buildings, (44) 486.
 - testing materials, (44) 483.
 - waterproofing, treatise, (43) 186.
- Engineers, shortage, how to meet, (43) U.S.D.A. 186.
- Engines—
- Diesel, fuels and uses, (41) U.S.D.A. 585.
 - farm, management, treatise, (49) 589.
 - for farm use, (42) 282.
 - for motor vehicles, (42) 486.
 - fuel saving with carbureter, (43) 890.
 - gas and gasoline, *see* Engines, internal-combustion.
 - intake-manifold temperatures, (43) 890.
 - internal-combustion—
 - alcohol as fuel for, (47) 90; (48) 90, 886.
 - brake horsepower, formula, (42) 685.
 - carburetion of gasoline and kerosene in, (49) 85.
 - characteristics under high compression, (48) 887.
 - coal tar as source of fuel, (49) 590.
 - combustion in, (44) 786.
 - control of gaseous detonation, (48) 385.
 - crankcase oil regeneration, (47) 891.
 - effect of heat flow, (43) 86.
 - effect of speed on mixture requirements, (50) 188.
 - for farm light and power plant, (46) 891.
 - frictional losses in, (48) 385.
 - fuel requirements, (44) 484.
 - fuels for, (43) 389; (50) 588.
 - horsepower determination, (44) 382.
 - ignition, (44) 485.
 - laboratory manual, (46) 890.
 - lubrication, (41) 691; (43) 86, 483.
 - mean effective pressures, (49) 485.
 - mechanical efficiency, (45) 392.
 - new fuel mixtures for, (43) 187.

Engines—Continued.

- internal-combustion—continued.
 - palm oil fuel for, (45) 185, 588, 690; (47) 90.
 - piston rings for, (44) 786.
 - research work in, (47) 291.
 - spark advance in, (42) 486; (50) 187.
 - use of oxidized oils in, (49) 387.
 - valve adjustments for low-grade fuel, (43) 483.
 - valve springs for, (43) 591.
 - vegetable oils as fuel, (48) 886.
 - weighing liquid fuel in, (42) 586.
- kerosene as fuel, (42) 586.
- lubricating troubles, causes, (43) 483.
- lubrication, (44) 586.
- oil, use in Indian agriculture, (42) 184.
- Still, description and tests, (42) 586.
- temperature and pressure stress, formulas, (43) 86.
- tractor, *see* Tractor engines.
- wear and lubrication, (47) 592.
- English hay, digestibility, (50) Mass. 168.
- English sparrows, *see* Sparrows.
- Entamoeba histolytica of man, carriage by flies, (45) 556.
- Enteric infection due to Bacillus suipestifer, (47) 170.
- Enteritis—
 - chronic, *see* Johne's disease.
 - in calves, treatment, (47) 85.
 - in fowls, treatment, (50) 82.
 - infectious, in cats, (45) 381.
 - infectious, in poultry, (49) 482.
 - infectious, in young pigs, control, (48) 584.
 - necrotic, in calves and lambs, (43) Wyo. 179.
- Enterohepatitis, *see* Blackhead.
- Entomological—
 - conference, imperial, of London, (47) 358.
 - education in agricultural colleges, (45) 658.
 - field experimentation, methods, (41) 250.
 - investigation, methods, (46) 51.
 - laboratory in Ceylon, (48) 798.
 - literature, indexing, (45) 657.
 - progress in British Columbia, (45) 454.
 - publications of U.S. Government, (50) 554.
 - Record, (47) 757; (49) 848.
 - records in Portuguese India, (47) 357.
 - research, bioclimatic law in, (41) 16.
 - research in Great Britain, (41) 399.
 - Society of British Columbia, (44) 653.
 - work in India, (42) 357.
- Entomologist law of Colorado, (50) 151.
- Entomologists, early forest, (48) 252.
- Entomology—*see also* Insects and specific kinds.
 - agricultural, of Brazil, (47) 253.
 - American economic, bibliography, (45) 852.

Entomology—Continued.

- and entomologists in Russia, (47) 552.
- and plant pathology in modern forestry, (47) 837.
- as affected by the war, (41) 57, 162.
- biological control, (50) 857.
- course for agricultural teachers, (47) 696.
- development in North America, (45) 250.
- development, rôle of drawings and draughtsmen, (45) 359.
- economic, class book, (41) 56.
- economic, in Mozambique, (49) 848.
- economic, in Quebec, (48) 852.
- economic, in Switzerland, (49) 448.
- economic, increasing effectiveness, (48) 252.
- economic, rôle of forestry in, (48) 851.
- for medical officers, (44) 754.
- forest, (48) 252.
- forest, treatise, (48) 252.
- in Porto Rico, status, (50) 657.
- Indian, list of publications on, (49) 849.
- lamp for taxonomic work in, (47) 51.
- manual, (50) 151.
- medical, relation to public health, (47) 847.
- medical, textbook, (50) 453.
- problems in, paper on, (42) 748.
- relation to forestry, (50) 844.
- sanitary, treatise, (45) 658.
- supergeneric names, nomenclature, (45) 550.
- treatise, (43) 850; (45) 453; (48) 250.
- Entomophthora—
 - chromaphidis n.sp., notes, (42) Calif. 852.
 - fumosa, notes, (48) U.S.D.A. 458.
 - sphaerosperma, artificial spread, (48) 750.
- Entomophthoraceae, insect enemies, (46) 51.
- Entomosporium maculatum, notes, (46) 543.
- Entylia bactriana, life history notes, (43) 850.
- Entyloma ranunculi, notes, (46) 44.
- Envelope for plant breeders, description, (42) 229.
- Enzym—
 - action, (48) 502.
 - action as affected by vitamins, (47) 664.
 - action, effect on etherization of tissues, (42) 129.
 - action in duodenum, estimating, (46) 708.
 - action in Echinodontium tinctorium, (48) 328.
 - action in fungi, (42) 225; (44) 27.
 - action in wood-destroying fungi, (48) 353.
 - action, mechanism of, (47) 127.
 - action of pollen, (48) 727.

Enzym—Continued.

- action of seeds, (43) 10.
 - action on organic substances, (42) 129; (44) 222.
 - action, review of literature, (45) 204.
 - action, studies, (41) 202, 409; (42) 502.
 - action, treatise, (43) 611.
 - indices of blood, (45) 9.
- Enzymes—*see also* Ferments.
- chemistry of, (45) 108, 204; (46) 9.
 - diastatic, measurement of amylolytic power, (42) 609.
 - diastatic, of flour, relation to strength, (48) 504.
 - digestive, effect in avitaminosis, (49) 161.
 - distribution in wheat endosperm, (45) 363.
 - effect of concentration on rate of digestion, (43) 611.
 - fat-splitting, rôle in immunity, (42) 270.
 - in muscle tissue, (48) 361.
 - in serum, effect on carbohydrate media, (43) 782.
 - lipolytic, in olive oil, (42) 502.
 - lipolytic, inhibition by ultra-violet rays, (42) 708.
 - of *Aspergillus oryzae* and malt, comparison, (43) 503.
 - of *Aspergillus repens* in condensed milk, (43) 779.
 - of avocado, (48) 108.
 - of butter, relation to tallowiness, (44) 273.
 - of microorganisms, bibliographic review, (48) 675.
 - of milk, relation to abnormal flavors, (43) Mo. 712.
 - of plants, reactions, (41) Del. 132.
 - of yeast, (44) 133.
 - oxidizing, of plants, (41) 203.
 - potency as affected by heat, (45) 880.
 - proteoclastic and peptoclastic, in green plants, (42) 228.
 - proteoclastic, in old flour, effect, (44) 761.
 - proteolytic, action on insulin, (50) 767.
 - proteolytic, of soil organisms, (41) 822.
 - reaction in plants, (44) Del. 424.
 - reactions in peach, (46) Del. 628.
 - respiratory, (47) Minn. 348.
 - secreted by *Rhizopus tritici*, (45) 144.
 - studies, (43) 311; (45) 109, 715.
 - use in clarification of fruit juices, (47) 206.
- Eosinophilia in parasitic infections, (47) 285.
- Epaenasomyia n.g. and n.spp., notes, (42) 56.
- Epelis truncataria faxonii on cranberry, (43) Mass. 158; (45) 551; (46) Mass. 52; (47) Mass. 452.

- Ephedrus incompletus, larval stages, (49) 559.
 - Ephelina, studies, (45) 746.
- Ephestia—
- affecting stored dates, (45) 759.
 - cautella, notes, (45) 552; (47) 758.
 - cautella on dried fruit, (43) 255.
 - kuehniella, *see* Flour moth, Mediterranean.
- Ephialtes aequalis, notes, (44) U.S.D.A. 163.
- Ephippiger terrestris, absence of complement in blood, (41) 754.
- Ephydra subopaca, biology, (46) N.Y. Cornell 751.
- Epiblema penkleriana, notes, (50) 554.
- Epicaerus formidulosus, notes, (41) Fla. 548.
- Epicauta—*see also* Blister beetles.
- spp., notes, (46) U.S.D.A. 158.
- Epidapus scabiei, notes, (49) 254.
- Epidemiology, experimental, (48) 82, 83, 84; (50) 784.
- Epidermal coverings in plants, importance of, (42) 628.
- Epidiaspis piricola, control, Calif. (44) 654, 752.
- Epididymis in rats, growth in weight, (42) 559.
- Epigae repens, root system, relation to soil fungi, (50) 428.
- Epilachna—
- borealis, *see* Squash beetle.
- corrupta—
- control, (49) N.C. 757.
 - distribution and life history, (48) 57.
 - life history and control, (47) Colo. 56.
 - new parasitic fly from, (49) 453.
 - notes, (43) Colo. 158; (44) 554, 657, Ala.Col. 751, Oreg. 850; (45) Ala.Col. 55; (48) U.S.D.A. 52.
 - on beans, summary of information, (42) U.S.D.A. 252.
 - studies, (43) U.S.D.A. 455; (49) N.Mex. 553.
 - summary, (45) Ala.Col. 158; (47) 555.
 - dodecastigma, life history, (45) 762.
 - 28-punctata, notes, (49) 758.
- Epilobium—
- angustifolium as honey plant, (41) Can. 556.
 - angustifolium as silage crop, (41) Alaska 30.
 - roseum and E. parviflorum, reciprocal hybrids, (42) 128.
 - spp., crosses, (44) 819.
 - variation and mutation in, (41) 330.
- Epinephrin for purpura hemorrhagica, (46) 686.
- Epinotia ilicifolia, notes, (47) U.S.D.A. 456.
- Epiphyma, studies, (45) 746.
- Epiphysis cerebri, studies, (45) 770.

- Epiphytes, distribution on tree trunks in Java, (46) 720.
- Epiphytes, osmotic concentration, (41) 220.
- Epipyropidae of India, (45) 657.
- Epipyrops fuliginosa n.sp., notes, (48) 552.
- Episimus tyrius n.sp., description, (49) 760.
- Epithelioma, contagious—
 in California, Calif. (42) 886; (48) 585.
 in chickens, (41) Nev. 288.
 in pigeons, relation to faulty nutrition, (49) 885.
 in Washington, (42) Wash. 886.
 of fowls, immunization, (45) 686.
 studies, (44) 881.
 syringe for control, (44) Wash. 683.
 vaccine, preparation and administration, (47) Calif. 685.
- Epitheliosis, contagious, studies, N.J. (44) 378; (46) 583; (48) 383.
- Epitrix—
 cucumeris, *see* Potato flea beetle.
 fuscula, notes, (42) N.J. 849.
 parvula, *see* Tobacco flea beetle.
 spp., control, (47) 163.
- Epiurus n.sp., parasitism by, (44) 356.
- Epizootics, control during war, (44) 678.
- Epochra canadensis, *see* Currant fruit fly.
- Epsom salts, place in poultry ration, (42) N.J. 872.
- Epyris extraneus, parasite of Gonocephalum seriatum, (43) 662.
- Equalizers, analyses, (42) 186.
- Equalizers and hitches for agricultural machinery, (42) 283.
- Equilibrium disturbances, inheritance of, (48) 567.
- Equisetum spp., transpiration, comparison, (42) 629.
- Equisetum, water requirement and adaptation, (42) 628.
- Eragrostis—
 abyssinica, culture and uses, (45) 133.
 cynosuroides, analyses, (45) 376.
 leptostachya, analyses, (50) 168.
- Eranthis hyemalis, variation in, (42) 725.
- Erax maculatus attacking white grubs, (42) 550.
- Eremnus horticola n.sp., description, (45) 258.
- Erepsin in calf fetus, (44) 865.
- Erepsin in pollen, (48) 728.
- Ergamin, effect on milk secretion, (48) 265.
- Ergot—*see also specific host plants.*
 cross inoculation experiments, (47) 245.
 culture, (48) 432.
 on grasses, specialization, (48) 432.
 on Paspalum laeve, (42) 474.
 studies, (46) 546; (50) 143.
- Ericaceae—
 mycorrhiza in, (49) 424.
 nitrogen fixation in, (49) 522.
 soil tests of, (44) 419.
- Ericales, relations in, (49) 424.
- Ericameria, succulent and mesophytic forms, acidity, (41) 29.
- Eriocera pela, studies, (49) 355.
- Eridontomerus pruinosa, notes, (45) Mich. 252.
- Erigeron, succulent and mesophytic forms, (41) 29, 133.
- Eriemosinus n.g., description, (46) Miss. 461.
- Eriocampoides—
 limacina, *see* Pear slug.
 matsumotonis n.sp., description, (42) 159.
 matsumotonis, studies, (48) 159.
- Eriochloa subglabra, notes, (41) Fla. 528.
- Eriodendron anfractuosum, durability test of wood, (43) 44.
- Eriogaster lanestris, blood cytology, (44) 758.
- Eriophorum spp., use as fiber plants, (44) 425.
- Eriophyes—
 ficus n.sp., description, (44) 649.
 gossypii, control, (49) V.I. 352.
 gossypii, immunity to, (41) 530.
 gossypii, notes, (43) 252; (45) V.I. 150; (47) 357.
 nalepai, studies, (41) 463.
 oleivorus, *see* Citrus rust mite.
 sp., notes, (47) 254.
- Eriopyga incincta, notes, (43) 164.
- Eriosoma—
 inopinatum n.sp., description, (47) 657.
 linguinosa, control, (47) 360.
 lanigerum, *see* Apple aphid, woolly, and Aphid, woolly.
- Ernestia ampelus, studies, (49) 555.
- Ernestia, Nearctic species, revision, (48) 254.
- Ernobius n.spp., notes, (41) 63.
- Erostosis of hock joint of fowl, (44) 881.
- Erynnia nitida, parasitism by, (47) 261.
- Erysipelas in hogs, *see* Hog erysipelas.
- Erysiphaceae, physiological specialization, (41) 152.
- Erysiphe—
 cichoriacearum, forms, (50) 347.
 cichoriacearum, notes, (45) 842; (50) 248.
 communis, notes, (46) 451.
 graminis, notes, (46) 239; (50) 548.
 horridula, specialization in, (50) 446.
 polygona, notes, (42) 146; (44) 445; (45) 48, 351; (46) 845; (48) 741; (50) Ohio 145.
 taurica, notes, (49) 45.
 tuckeri, notes, (42) 49.
- Erythraea linariifolia, habitat, (44) 820.
- Erythraspidites caryae, notes, (41) Conn. State 159.
- Erythrocytes in infectious horse diseases, (47) 487.
- Erythroneura—
 comes, *see* Grape leafhopper.
 Nearctic species and varieties, key, (44) 352.

Erythroneura—Continued.

spp., studies, (50) 755.

tricincta, notes, (49) 654.

Eschscholtzia californica, color pigments of, (43) 632.

Essence industry in France, (44) 45.

Essential oils, *see* Oils, essential.

Estate in Egypt in third century B. C., (50) 891.

Estate regulations of Charles the Great, (45) 491.

Esterase determination in blood, (45) 9.

Esthonia, effect on plants, (44) 421.

Ethanol from fermentation of corn, (50) 12.

Ether—

anesthesia in plants, (47) 426.

as gasoline substitute, (43) 187.

effect on catalase production, (42) 259.

effect on respiration, (41) 524, 632.

extract, determination, (43) 115.

extract of feces, notes, (50) 804.

extract of soy bean leaves, studies, (42) 411.

in alcohol-ether mixtures, determination, (49) 114.

Etherization, effect on duration of life in *Drosophila*, (48) 166.*Ethmia maceliosiella*, life history, (46) 856.

Ethyl acetate, use as protein precipitant, (44) 805.

Ethyl alcohol—

as solvent in titrations, (47) 204.

formation, (44) 309.

from western larch, (48) 416.

manufacture from wood waste, (45) 15; (47) U.S.D.A. 113.

production process, (41) 414.

substitutes for, (49) Wis. 611.

Ethyl and methyl alcohol, determination, (46) 505.

Ethylene, effect on abscission of flowers, (42) 333.

Ethylhydrocuprein hydrochlorid, toxicity of, (42) 880.

Ethylite as motor fuel, (49) 590.

Eubacteriales, classification, (44) 517.

Eubiomyia calosomae, life history, (42) 652.**Eubrachymera debilis**—

notes, (46) 59.

parasitism by, (42) S.Dak. 850; (44) 556.

Eucalypnatus tessellatus—

control, (47) 53.

notes, (47) U.S.D.A. 359.

Eucalyptol, chlorinated, description, (41) 781.**Eucalypts**—

as source of honey, (47) 443.

shoot-bearing tumors, (41) 728.

timber-producing, culture, (48) 345.

Eucalyptus—

ascaricidal value, (45) Okla. 478.

culture and uses, (44) 46.

Eucalyptus—Continued.

culture, instructions for, in Brazil, (43) 442.

diseases, (47) 44.

globulus, parasite of, (47) 51.

growth measurements, (42) Calif. 838.

growth rate in New Zealand, (42) 540.

injury from high temperatures, (46) 446.

marsdeni n.sp., description, (41) 245.

n.spp., description, (42) 348; (45) 141; (46) 737.

notes and new species, (41) 744, 745.

oil, germicidal activity, (42) 174.

oil, value against chicken nematodes, (50) Minn. 152.

oils, analyses, (45) 350, 613.

oils, bibliography, (47) 443.

Polysaccum crassipes on, (41) 453.

pumila, oil analysis, (42) 348.

regnans, growth, studies, (42) 739.

revision of genus, (43) 543; (47) 346.

study of genus, (45) 350.

wood, analyses, (48) 415.

yield table, (44) Calif. 742.

Eucarazzia, new genus, erection, (47) 55.*Eucepes* (*Cryptorhynchus*) *batatae*, notes, (42) 159.*Euclemensia bassettella*, studies, (41) 164.*Eucosma discretivana* n.sp., description, (45) 156.*Eucosminæ*, revision, (49) 254.*Eudemis* moth, arsenicals for, (45) 454.*Eudemis* moth in Bordeaux, (41) 59.*Eudemis vacciniana*, *see* Fireworms.**Eugenics**—

and genetics, treatise, (47) 67.

international exhibition of, (49) 568.

papers on, (49) 567.

textbook, (48) 564.

Euglobulin, immunizing power, (42) 475.*Euglobulin*, vaccinal, mode of action, (42) 475.**Eulecanium**—*coryli*, notes, (43) 252.*nigrofasciatum*, *see* Terrapin scale.*persicae*, *see* Peach scale.**Eulia**—*mariana*, new apple feeder, (48) 54.*pinatubana*, life history, (41) 665.

spp., life history studies, (50) Pa. 454.

velutinana, control, (49) Pa. 251.*velutinana*, notes, (44) U.S.D.A. 458, 656; (46) 749.*Eumarchalia gennadiosi*, notes, (41) 455.*Eumastacinae*, notes, (45) 658.*Eumenes* spp., synopsis, (43) 60.*Eumenidae*, synopsis, (43) 60.**Eumerus strigatus**—

control, (50) 452.

notes, (41) 358, 549; (42) 548; (48) 855; (50) 156.

Eumyias v. Stoporala, (41) 547.**Euonyms scale**—

egg stage, notes, (50) Conn.State 50.

notes, (47) Conn.State 156.

- Euoplothrips*, new genus, erection, (42) 154.
Eupalopsis pavoniformis n.sp., description, (47) 558.
Eupatorium urticaefolium—
 feeding tests, (49) Ind. 580.
 poisonous to livestock, (49) Ind. 584.
Eupelminus saltator, notes, (45) Mich. 252.
Eupelmus—
 allynii, life history studies, (45) 460.
 allynii, notes, (45) Mich. 252.
 sp., notes, (43) U.S.D.A. 365.
Euphalerus citri, notes, (43) 451; (47) 254.
Euphorbia—
 latex vessels, function, (43) 525.
 rusts, seed carriage of, (49) 442.
 transpiration and absorption by roots, (45) 335.
Euphyllura arbuti, life history, (49) 252.
Eupodes volucris, notes, (41) 852.
Euproctis—
 chrysorrhoea, *see* Brown-tail moth.
 edwardsi, caterpillars, rashes due to hairlets of, (44) 758.
Eupteryx, Nearctic species, (41) 253.
Eureka, analyses, (50) Oreg. 7.
Europasca sp., notes, (42) 249.
Eurytoma—
 amygdali, notes, (45) 454.
 bolteri, notes, (45) Mich. 252.
 spp., notes, (45) 459.
Euscepes batatae, notes, (45) V.I. 150; (48) 153.
Euschistus—
 impictiventris, notes, (42) Ariz. 357.
 variolaris, notes, (47) N.Y.Cornell 848.
Eusol, antiseptic value, (41) 475.
Eustrongylus gigas, anatomical lesions caused by, (49) 177.
Eustrophus bicolor, notes, (42) 158.
Euteles sp., parasitism by, (45) 256.
Eutelus—
 bruchaphagi, notes, (43) U.S.D.A. 365.
 mayetiola n.sp., description, (41) 64.
 mediterraneus, notes, (48) 158.
Eutermes morio on sugar cane, (42) 52.
Eutettix tenella, *see* Beet leafhopper.
Euthrips—
 cameroni n.sp., description, (42) 648.
 helianthi, notes, (46) 853.
 insularis, notes, (48) 153.
 pyri, *see* Pear thrips.
 tritici, *see* Flower thrips and Frankliniella tritici.
Euthrombidium sp., notes, (47) S.Dak. 451.
Euthyrhynchus floridanus, notes, (44) 549.
Euthyrhynchus medietabundus, life history, (46) 254.
 "Eutin," use of term, (43) 861.
Eutrixia exile, parasite of white grubs, (42) 550.
Eutrixoides jonesii, parasite of white grubs, (42) 550.
Eutypella cocos, notes, (47) 547.
Euura laeta in Sweden, (41) 759.
Euxoa segetis on tobacco, (43) 52.
Euxoa spp. in Rhodesia, remedies, (41) 62.
Euzenillipsis diatraeae, notes, (49) La. 848.
 Evaporating plant, cooperative, (45) 720.
 Evaporation—
 amount and temperature of, (43) 16.
 and area of evaporating surface, relation, (41) 15.
 and forest fires, (45) U.S.D.A. 320.
 and precipitation of the earth, (47) 615.
 and run-off formulas, (48) 285.
 as affected by forests, (44) U.S.D.A. 716.
 as affected by wind, (43) 16.
 from bare and cultivated soils, (50) 117.
 from different soils, (44) 210.
 from naturally stratified soils, (47) 811.
 from soil, (42) 513; (48) 513; (50) 812.
 in forests, (42) 117.
 in relation to forest planting, (47) 539.
 loss of rainfall from, (42) U.S.D.A. 318.
 observations, (46) U.S.D.A. 618.
 of fruits, (49) U.S.D.A. 411.
 pans, types, (44) U.S.D.A. 717.
 rate of, (45) 511.
 rates from different surfaces, (48) 826.
 relation to wind flow and temperature, (42) 511; (44) 131.
 studies, (41) Ariz. 379; (44) 729.
 vegetative, effect on temperature changes, (45) U.S.D.A. 319.
 Evaporative capacity, use of term, (42) U.S.D.A. 618.
 Evaporator—
 for desiccation of liquids, description, (41) 615.
 for drying fruit, description, (41) 651.
 (43) 808.
 for drying grapes, description, (43) Calif. 715.
 Evaporators, types, (44) 810.
 Evaporimeter for forest studies, (41) U.S.D.A. 725.
 Evaporimeters and movement of fluids in membranes, (47) 30.
Evergestis straminealis, notes, (45) U.S.D.A. 660.
Evergreen leaves, fat storing by, (42) 433.
 Evergreens—
 broad-leaved, for Ohio, (43) Ohio 342.
 cultivated, treatise, (50) 240.
 for the Northern Plains, (41) 243.
 in Finland, (50) 838.
 ornamental, notes, (43) U.S.D.A. 339.
 popular account, (45) 539.
Everifarm, romance of, (48) 396.
Evetria buoliana, parasites of, (43) 259.
 Evolution—
 and genetics in plants, (44) 631.
 and mutations, (46) 524.

Evolution—Continued.

- by hybridization, (41) 223.
 - by mutation, (49) 567.
 - factors, (49) 821.
 - genetics, and eugenics, textbook, (48) 564.
 - in plants, treatise, (44) 218.
 - initiative in, treatise, (45) 267.
 - of plants, (46) 524.
 - organic, treatise, (43) 521.
 - studies, (46) 573.
 - through normal diversity, (41) 522.
- Ewes—*see also* Sheep.
- breeding, feeding experiments, (46) Mont. 364; (49) Mont. 168, Wyo. 467.
 - breeding, wintering, (42) Okla. 264; (43) 870; (46) 72; (47) Okla. 71, 75, Ohio 773, Iowa 775; (49) Ohio 269, Okla. 467, 670, Iowa 773.
 - Corsican, milk of, (49) 175.
 - creatin excretion, (41) 672.
 - factors controlling fertility and fetal atrophy, (47) 863.
 - feed requirements, (49) 67.
 - feeding experiments, (43) Wash. 772.
 - injury by squirrel-tail grass, (41) Nev. 782.
 - milk of, change during lactation, (47) 79.
 - milk, quantity and composition, (41) 176.
 - milking, management in Argentina, (43) 876.
 - mountain, breeding experiments, Ky. (48) 170, 371.
 - mountain, grading up, (48) Ky. 170.
 - ovarian grafts in, (47) 573.
 - poisoning by cottonseed, (42) Okla. 265.
 - pregnant, effect of heavy silage feeding, (47) Wyo. 171.
 - pregnant, iodine feeding, (41) Iowa 286.
 - pregnant, roughages for, (44) Ariz. 571.
 - pregnant, soy bean hay for, (44) Iowa 471.
 - production of twins, factors affecting, (46) U.S.D.A. 170.
 - range, feeding experiments, (50) 776.
 - reproductive qualities, effect of cottonseed meal, (49) N.C. 773.
 - spring care, (47) Mich. 196.
 - sunflower silage v. alfalfa hay for, (43) Mont. 69.
 - wheat straw for, (45) Kans. 267.
 - wintering, (47) Pa. 473.
- Exanthema, coital, and horse pox, (46) 778.
- Exanthema, notes, (49) Calif. 649.
- Excavating machinery, (46) 381.
- Excavation, engineering, treatise, (50) 286.
- Excavation, machinery and costs, (42) 482.
- Excelsior, insulating value, (44) 588.
- Exenterus affinis n.sp., description, (43) 857.

Exoascus—

- deformans, control, (50) 451.
 - deformans, notes, (42) 49; (43) 246, 445; (44) 346, 446; (45) 356; (46) 348, 453, 544; (47) 49.
 - pruni, notes, (48) 242.
 - spp., lime-sulphur for, (43) 346.
 - (Taphrinella) purpurascens on sumac leaves, (43) 49.
- Exobasidium—
- hesperidum n.sp., notes, (43) 152.
 - new species, (48) 143.
 - oxycocci on cranberries, (43) Mass. 155; (45) U.S.D.A. 54.
 - vaccinii on cranberries, (45) U.S.D.A. 54.
 - vexans, notes, (47) 754.
- Exochilum mundum, notes, (49) 555.
- Exochus (Triclistus) evetrieae n.sp., description, (43) 857.
- Exorista flavivittata, notes, (50) 258.
- Exoristoides johnsoni, parasitism by, (44) 652; (47) S.Dak. 451.
- Experiment—
- farms, county, Ohio (43) 339; (49) 792, 798.
 - station—
 - at Cuba, (46) 96.
 - at Vaulx-de-Cernay, establishment and work, (47) 571.
 - establishment in Algeria, (42) 494.
 - for corn culture in Italy, (46) 832.
 - for fig culture in California, (42) 94.
 - new, in Italy, notes, (44) 500.
 - of Central Institute, Sweden, guide for visitors, (49) 527.
 - of Yonne, (46) 294.
 - opening at Tifton, (42) Ga. 197.
 - opening in San Domingo, (42) 198.
 - position in college of agriculture, (49) 492.
- Station Record—
- back numbers available, (42) 5.
 - change in editorial management, (50) 5.
 - changes in, (42) 4.
 - classification of abstracts, (43) 404.
 - evolution of, editorial, (50) 3.
 - notes, (44) 497; (46) 199.
- station—
- relation to graduate work, (49) 596.
 - work, economy in, (41) 301.
 - work, relation to extension program, (49) 492.
 - worker and work, editorial, (48) 1.
- stations—*see also* Alabama, Arizona, etc.
- and Department of Agriculture, coordination of work, (41) 610.
 - and their funds, editorial, (43) 1, 708.

Experiment—Continued.

stations—continued.

- attitude toward mixed feeds, (47) 278.
- Canadian, soldier training at, (41) 200.
- changes in administration, editorial, (45) 301.
- cooperation and coordination of work, editorial, (42) 304.
- cooperation in research, (43) 708, 709.
- development and value, (48) Oreg. 298.
- future, (49) 596.
- home economics at, editorial, (46) 601.
- identity, editorial, (44) 601.
- importance of long-time program, (47) 601.
- in Brazil, (42) 199, 800.
- in Denmark and Norway, work, (50) 28.
- in Finland, (49) 399.
- in Italy, reform, (45) 596.
- in middle life, paper on, (49) 491.
- in Yugoslavia, (44) 798.
- institutional ethics, (41) 604.
- laws concerning, U.S.D.A. (42) 496; (49) 195.
- list of projects, (46) U.S.D.A. 297.
- maintaining volume of research, (50) 405.
- nature and scope of future plans, (47) 606.
- need of increased funds, (43) 708; (44) 498.
- new, in Italy, (47) 195.
- of Canada, (48) 692.
- organization and policy, (41) 611; (49) 709.
- organization list, U.S.D.A. (41) 197; (49) 492.
- personnel, editorial, (44) 301.
- present position and outlook, (41) 606.
- present problems, (43) 703.
- project essentials, editorial, (43) 302.
- projects, catalogue, (44) 1; (45) U.S.D.A. 94.
- projects, classified list, U.S.D.A. (47) 397; (49) 898.
- projects, classified list, editorial, (47) 306.
- publication of results, (43) 709.
- publications and projects, (46) 404.
- publications on plant pathology, check list, (47) 307, U.S.D.A. 347.
- range studies by, (48) 601.
- relation to Office of Farm Management, (42) 789.
- research work as affected by the war, (43) 707.

Experiment—Continued.

stations—continued.

- specialization and correlation of work, (46) 105.
- work and expenditures, U.S.D.A. (41) 197; (42) 693; (46) 598; (47) 397; (49) 897.
- work and expenditures, editorial, (47) 301.
- work, duplication in, (46) 401.
- Experimental data, statistical significance, (50) 569.
- Experimental fields, establishing, soil type as basis, (49) 616.
- Explosive, new agricultural, (50) Mich. 484.
- Explosives—
 - effect of soil moisture on, (42) Wis. 384.
 - for subsoiling, (42) 183.
 - industry, corn cob cellulose in, (45) 616.
 - nitrogenous potassic fertilizers from, (46) 626.
 - strength, effect of cartridge diameter, (49) 83.
 - use in agriculture, (45) 891; (50) N.J. 791.
 - use in blasting stumps, (46) U.S.D.A. 85.
 - use in farm drainage, (49) 483.
 - use in land clearing, (42) 183, 278; (43) U.S.D.A. 282; (45) Ala.Col. 81.
 - use in road construction, (44) U.S.D.A. 585.
 - v. horse power for land clearing, (42) Minn. 888.
 - war, use in land clearing, (43) 480.
 - war-salvaged, tests, (45) Wis. 290.
- Export packing, treatise, (46) 383.
- Export trade of Argentina in 1919, (43) 95.
- Extension work, *see* Agricultural colleges and Agricultural extension.
- Extraction apparatus, description, (41) 113; (43) 413.
- Eye defects—
 - induced, transmission, (44) 566.
 - inheritance, (49) 567.
- Fabraea maculata, control, (48) N.J. 351.
- Fabre, J. H., biography, (50) 253.
- Fabrics—*see also* Textile.
 - treatise, (44) 393.
 - water resistance of, (42) 417.
 - woven, treatise, (50) 695.
- Fairs, community and county, suggestions for, (49) 96.
- Fairs, score cards for, (50) 195.
- Fallowing—
 - cultivated v. uncultivated, (42) Calif. 822.
 - effect on crops, (47) Wyo. 131; (43) Minn. 322.
 - experiments, (41) 229; (46) U.S.D.A. 130, Mont. 830.
 - experiments, summer, (45) Mont. 339.
 - for weed control, (41) 737.

Following—Continued.

- summer, (41) U.S.D.A. 442.
- value, (47) 25, U.S.D.A. 430.

Family budget—

- effect of increased cost of living, (44) 169.
- for small income, (50) 797.
- budget systems, (46) 96.

Family life on moderate income, treatise, (46) 792.

Famine foods in India, (45) 61.

Famine rations in Russia, (48) 859.

Fannia canicularis—

- biology of, (46) 51.
- Empusa disease in, (42) 361.
- n.sp., parasite of white grubs, (42) 550.

overwintering, (48) 157.

Fannia sp., notes, (50) 358.

Fans, dust-collecting, for threshing machines, (43) U.S.D.A. 390.

Farcy, *see* Glanders.

Farina, manufacture from potatoes, (42) 211.

Farm—

- accounting, (42) Mich. 694; (44) 197. 691; (45) Ohio 190, Tex. 396, 893; (47) 294, Minn. 392, 594, 695; (48) 687; (49) 292; (50) 290.

accounting—

- allocation of rent and interest in, (50) 199.
- cooperation in, (46) 493.
- for income tax purposes, (48) 491; (49) 692.
- importance of, (45) Mo. 292.
- in rural schools, (50) 195.
- institutions for, (46) 591.
- manual, (50) N.J. 492.
- model forms for, (42) 491.
- objectives in, (49) 591.
- on peasant farms, (42) 790.
- on successful farms, (49) N.Y. Cornell 690.
- studies, (50) Minn. 191.
- systems, (44) 289, 487.
- textbook, (50) 898.
- value of double-entry bookkeeping, (42) 895.

and terminal market prices, (48) U.S. D.A. 92.

animals, *see* Animals, Livestock, Cattle, *etc.*

areas, surveys, (44) 487.

bequest to French Academy of Agriculture, (47) 900.

building layouts, plans, (48) 685.

building ventilation, notes, (42) 86.

buildings—

- and equipment, description, (41) 419.
- concrete, construction, (43) 90, 188.
- construction, (45) 83, Ind. 186; (50) 97.
- construction, treatise, (41) 488.

Farm—Continued.

buildings—continued.

- developments in, (46) 99; (47) 191.
- equipment and ventilation, (48) 199.
- failure in a tornado, (48) 198.
- floors for, (47) 91.
- for small holdings, (47) 688.
- group planning, (48) 198.
- plan and construction, (49) 487.
- plans, (42) 285, 687, Calif. 894; (43) 892; (47) 688.
- treatise, (43) 592; (47) 91.
- ventilation, (43) 892; (48) 685; (50) 97, 689.
- ventilation systems, design and operation, (48) 488, 489.

bureau—

- and county agent, (48) 192.
- county, organization plan, (42) U.S.D.A. 289.
- first, establishment, anniversary celebration, (44) 799.
- function, (41) Calif. 93; (42) 790.
- movement, treatise, (46) 386.
- of Illinois, history, (47) 797.
- relation to horticulture, (43) 643.

business—

- adjustment to declining prices, (44) 196; (45) 191.
- analysis, (43) 792; (44) U.S.D.A. 89; (49) Idaho 88; (50) 199, 394.
- in Quebec, Can. (44) 288; (46) 893.
- organizing, (45) 794.
- cadet report, (44) 297.
- capital and profits, (49) 792.
- colonies, in New Jersey, (44) 890.
- community in New York, national influence of, (46) U.S.D.A. 386.
- competition in Victoria, (47) 294.
- competition, interdistrict, (47) 594; (48) 686.
- cost and price indexes, (43) Mo. 792.
- cost system, (42) 290.
- costs in Ireland, determination, (42) 593.
- crops, graphic summary of seasonal work, (47) U.S.D.A. 295.
- crops, laboratory manual, (45) 599.
- crops, seeding card, (44) 796.
- devastated, in France, restoration, (49) 292.
- development studies, (46) Minn. 493.
- devices, helps, hints, *etc.*, (41) 699.
- diets, (45) U.S.D.A. 763.
- drainage, (45) Oreg. 687.
- drainage machinery, (43) 589.
- economics, courses, (44) 197.
- economics, research, (46) 783.
- economics, State program, (46) 783.
- efficiency tests, (44) 197.
- electric plant, cost, (45) Mich. 690.

Farm—Continued.

- elevators, design, (45) 791.
- engines, handbook, (42) 282.
- engines, management, treatise, (49) 589.
- engines, tests, (45) 186.
- equipment—
 - costs, (46) Mo. 387.
 - increase in value, division between landlord and tenant, (49) 892.
 - intra-company standardization, (50) 485.
 - manufacture and sale, (47) U.S.D.A. 190.
 - standardization, (48) 386.
- fertility, treatise, (49) 510.
- finances, (45) 293; (47) 866.
- financing and business prosperity, (49) 190.
- forestry, (46) 42.
- forestry, value of, (44) U.S.D.A. 147.
- gates, plans, (42) 285.
- Home Business Unit, descriptive leaflet, (43) 191.
- home survey, (44) 892.
- homes—*see also* Rural homes.
 - and land tenure, (49) Nebr. 189.
 - conveniences in, (45) 187.
 - equipment, (50) 97.
 - family living in, (50) U.S.D.A. 595.
 - improved conditions in, (43) U.S.D.A. 894; (44) U.S.D.A. 490, 491.
 - in Nebraska, (50) 893.
 - living conditions, (49) Nebr. 595.
 - need for labor saving in, (44) 192.
 - paper on, (50) 895.
 - plans, (48) 288; (49) Wis. 689.
 - survey, (46) 695.
- household management instruction in Belgium, (49) 797.
- houses, design of stairways for, (44) 287.
- houses for England, plans, (43) 892.
- houses, plans, (41) 488, U.S.D.A. 692. 791; (43) 791.
- hygiene, book on, (41) 279.
- implement industry, intra-company standardization, (50) 98.
- implement industry, notes, (50) 96.
- implements—
 - and machinery, treatise, (50) 189.
 - and tools, care, (50) 388.
 - blue book, (45) 392.
 - draft, (49) Iowa 788.
 - draft and operation cost, (46) Mo. 385.
- improvement in Friesland, (44) 891.
- improvements, assignment of value at time of change in contract, (49) 891.
- income, division between landlord and tenant, (43) 489.
- incomes, variation in, (44) U.S.D.A. 89.

Farm—Continued.

- industries, treatise, (41) 506, 592.
- institutes in Great Britain, (47) 900; (48) 395.
- inventories, (44) U.S.D.A. 593.
- investments, change in value, (47) 294.
- kitchens, arrangement, (44) 689.
- labor, *see* Agricultural labor.
- land—*see also* Land.
 - appraisal, sale prices as basis, (48) Minn. 595.
 - gift to British Government, (46) 398.
 - in United States, (41) U.S.D.A. 693.
 - price variations, (42) 894.
 - valuation, (46) 593.
 - values in Iowa, (43) U.S.D.A. 893.
- lands—
 - agricultural and market value, Mo. (45) 292; (48) 686.
 - available for settlement, (48) U.S.D.A. 293.
- layouts, study, (44) N.Y. Cornell 889
- lease contract, (44) U.S.D.A. 290.
- lease forms, (50) Iowa 91.
- leases, (41) Minn. 93, Kans. 791; (45) Ohio 693.
- leases, collective, in Italy, (42) 491.
- leases in Belgium, revision of laws, (47) 893.
- leases, modification in France, (47) 295.
- leasing systems, (44) Wis. 290.
- light and power yearbook, (48) 185.
- lighting plants, storage batteries for, (42) 86.
- lighting, studies, (48) 198.
- Loan Act, Federal, *see* Federal Farm Loan Act.
- loan association, national, directions for forming, (46) 90.
- Loan System, Federal, (47) Ill. 492.
- loans, Federal, (43) 394.
- loans, Federal, analysis, (45) 692.
- loans, Federal, plans for use, (42) 87.
- loans, short-time, (46) U.S.D.A. 786.
- loans, types, (43) 192.
- machinery, *see* Agricultural machinery.
- management, (44) 197, 289, Mont. 384; (45) U.S.D.A. 86; (46) 389; (49) Ky. 592.
- management—
 - and organization in Georgia, (47) U.S.D.A. 690.
 - control, (45) 893.
 - data, analysis, (50) 689.
 - distinction from rural economics, (42) 789.
 - extension teaching in, (41) 895; (42) 897.
 - human factor in, (43) 793.
 - in Belgian Kongo, (45) 894.
 - in Belgium, (45) 694.
 - in California, (47) Calif. 690.
 - in Gallatin Valley, (49) Mont 188.

Farm—Continued.

management—continued.

- in Great Salt Lake Valley, (50) Utah 190.
- in North Carolina, (47) U.S.D.A. 892.
- in Ontario, (42) 290, 688; (43) 291; (44) 190, 690; (45) 694; (49) 592, 593.
- in Pennsylvania, (42) Pa. 170; (43) U.S.D.A. 692.
- in Saskatchewan, (49) 894.
- in the South, testing efficiency, (42) U.S.D.A. 895.
- in Victoria, (42) 593; (47) 392.
- normal institute in Belgium, (46) 194.
- on dry land areas, (49) Mont. 188.
- papers on, (50) 197.
- problems, (43) 693.
- recitation in, (49) 797.
- relation to economics, (48) 686.
- research, (46) 783.
- research projects, (42) 789.
- schools for rural women, (44) 695.
- State programs, (46) 389, 783.
- statistical analysis, (50) 390.
- studies, (41) Ky. 91, Mo. 694; (43) Mo. 793; (46) N.J. 590; (47) Mont. 490, Mont. 491; (50) Mont. 191.
- successive surveys, 1912–1917, variations in, (41) 693.
- survey, (43) W.Va. 92; (47) Iowa 93, Miss. 294.
- survey in New Jersey, (42) 290.
- surveys, data from, (49) Miss. 488.
- textbook, (46) 693.
- treatise, (50) 590.
- wages of, (42) 689; (45) 794.
- market, importance, (49) 190.
- meats, treatise, (49) 570.
- mechanics—
 - and livestock, treatise, (48) 497.
 - for Utah high schools, (50) 797.
 - in high schools, (44) 494.
 - instruction in Argentina, (42) 294.
 - textbook, (48) 395.
 - treatise, (41) 487; (49) 284.
- memorandum book, (42) 599.
- model, in Panama, (50) 700.
- mortgage financing, treatise, (49) 594.
- mortgage loans, (46) U.S.D.A. 786.
- mortgages, market for, (47) 692.
- motor and implement courses, standardization, (50) 100.
- motor courses, standardization, (48) 197.
- organization, (43) 692; (45) Idaho 188; (49) Ind. 592; (50) Minn. 889.

Farm—Continued.

organization—

- and cost of production, N.Dak. (48) 490, 491.
- and practice, changes in, (46) 892.
- as affecting costs of production, (42) 88.
- effect of capital on, (44) Mo. 788.
- methods of study, (46) U.S.D.A. 291.
- mobility of factors of production, (45) 85.
- of Royce and Santerre, (49) 489.
- outline of studies, (41) U.S.D.A. 386.
- studies in irrigated area, Mont. (47) 490, 491.
- use of investigational data, (42) 789.
- organizations, (47) 295.
- ownership and tenancy in Texas, (47) U.S.D.A. 691.
- ownership, attaining, (44) Kans. 288.
- ownership in Massachusetts, (50) 690.
- ownership in United States, (46) 893.
- power, (44) 197; (45) 690; (48) U.S.D.A. 786.
- power—
 - and lighting, handbook, (46) 891.
 - and machinery, effect, (47) 597.
 - cost and utilization, (46) U.S.D.A. 383.
 - economic problems, (47) 594.
 - projects, proposed, (42) U.S.D.A. 892.
 - studies, (50) 98.
- practice—
 - principles, (47) 195.
 - relation of bioclimatic law to, (41) 16.
 - work, supervised, State program for, (49) 492.
- prices, future trend, (50) 198.
- prices, geographical phases, (41) U.S.D.A. 593.
- products, *see* Agricultural products.
- profits, (44) U.S.D.A. 590.
- profits and losses, plan for sharing, (42) 593.
- profits and war prices, (41) Wis. 90.
- projects in elementary agriculture, (47) 696.
- publicity, (42) Wash. 397.
- records, (45) Tex. 396.
- rent contracts in Italy, (45) 593.
- sanitation, (46) 99; (47) 187.
- selection, (43) U.S.D.A. 291.
- shop work, course of study, (49) 195.
- shop work in agricultural education, (44) 296.
- shop work, short course in, (48) 192.
- shop work, teaching and projects, (44) 193.
- size of, effect on population, (43) 763.

Farm—Continued.

- standard of living, factor in cost of production, (45) Mo. 292.
- State, outline of project, (42) 490.
- stock-taking, (49) 692.
- survey in Missouri, (45) 695.
- surveys, (44) 697, 892.
- tenancy—*see also* Land tenancy and Land tenure.
- Land tenure.
- and ownership in Nebraska, (41) 387.
- and property tax, (43) 895.
- evils of in United States, (42) 288.
- in Great Britain, (42) 287.
- in Illinois, (43) 593; (45) 88.
- in Nebraska, (50) Nebr. 290.
- in 1920, (46) 893.
- in United States, (45) Tex. 593.
- in wheat belt, forms of lease, (43) U.S.D.A. 290.
- paper on, (44) 196.
- survey, (45) Wis. 294.
- systems, comparison, (43) Mo. 190.
- tenants in Iowa, (50) Iowa 892.
- tenants in North Carolina, living conditions, (50) 493.
- timber, measuring and marketing, (46) U.S.D.A. 237.
- timbers, creosoting, (48) 783, Mo. 885.
- timbers, treatment, (42) S.C. 85; (49) Mont. 184.
- tramways in England, (43) 484.
- Turretfield Demonstration, report, (48) 91.
- two-man, in New Hampshire, (47) 893.
- wagons, tractive resistance, (42) Calif. 894.
- water supply in Canada, (42) 575.
- water supply in the home, (47) 688, 689.
- women and home, (47) 297.
- women, bibliography of, (41) 492, 592.
- women, views on country life, (50) 393.
- woodlands, lessons, (44) U.S.D.A. 94.
- woodlands, treatise, (50) 695.
- woodlots, improvement, (50) Mich. 242.

Farmer—

- and farm market, address, (43) 91.
- and foreign markets, (44) 690; (45) U.S.D.A. 798.
- and town, service relationships, (49) Wis. 690.
- in relation to packer, (44) 197; (45) 694.
- in relation to the Department, (45) U.S.D.A. 799.
- movements and marketing, (48) U.S.D.A. 890.
- rôle as a producer of wealth, (43) 91.

Farmers—

- agricultural education for, (47) 97.
- American, rôle in financing world credit, (45) 896.

Farmers—Continued.

- and city labor, common interests, (42) 689; (44) 490.
- and finance, address, (42) 87.
- and labor movement, (48) 190.
- and tariff, (45) 594.
- and the new day, (42) 286.
- and the single tax, (45) 693.
- annual excursion to the station, (49) 599.
- benefit of patent system, (41) 491.
- bulletins adapted to use by teachers, U.S.D.A. (42) 299, 396, 598.
- bulletins, method of use by teachers U.S.D.A. (44) 697, 698.
- children, schools for, (47) 298.
- club of Pennsylvania, notes, (43) 486.
- clubs in England, (50) 696.
- cooperative associations, (45) 594.
- cooperative associations under Federal law, status, (45) 897.
- cooperative movement in Alberta, (47) 394.
- cooperative societies, incorporation, (44) 691.
- credit rating, (42) 87.
- daughters, instruction for, (44) 698.
- Exchange, Eastern States, plan, (42) 289.
- financing, (46) 192.
- fuller representation in politics, (42) 286.
- immigration and emigration, (45) 88.
- income of, (49) 290.
- income tax assessment in Great Britain, (50) 192.
- institutes in United States, U.S.D.A. (41) 198; (42) 396.
- Japanese, in California, (41) 491; (44) 191.
- library, book list for, (46) Ill. 697.
- meat ring, organization, (47) 374.
- net income, increasing, (50) 591.
- organization, (41) 889.
- organization in Canada, (44) 387.
- organizations, experiences with politics and legislation, (49) 295.
- organizing for economic and political action, (50) 393.
- place in the commonwealth, (46) 91.
- problem and the remedy, (41) N.Dak. 92.
- problems, (46) 387.
- purchasing power, (46) 90; (50) 691.
- purchasing power, organization, (43) U.S.D.A. 488.
- short courses for, (48) West.Wash. 298.
- Union, (44) 893.
- use of crop reports by, (49) 90.
- vocational courses for, (48) 896.
- winter school, (46) Wash. 297.

Farming—*see also* Agriculture.

- business, (47) 794.
- by motor, (42) 588.
- by the State, proposed, (42) 491.

Farming—Continued.

- costs, determination, treatise, (46) 493.
- dairy, *see* Dairy farming.
- diversified, value, (49) Wis. 690.
- economic phases, (47) 798.
- economics of, treatise, (47) 689.
- effect of foreign exchange on, (42) 894.
- experiences of settlers, (41) Minn. 91.
- for women, handbook, (41) 492.
- handbook, (44) 495.
- in Corn Belt, (46) 784.
- in Great Britain, financial results, (41) 193.
- in Minnesota, costs, (41) Minn. 91.
- in South, economic factors affecting, (42) U.S.D.A. 731.
- in South, suggestions to teachers, (44) U.S.D.A. 698.
- in timbered section, (41) Minn. 386.
- in western Kansas, suggestions, (50) 828.
- initial capital required, (43) 94.
- livestock and crop, comparison, (41) N.Dak. 140.
- livestock and grain systems, (44) Ill. 721; (48) 218.
- mixed, and apple growing in Ontario, (49) 592, 593.
- occupations, vocational education in, treatise, (49) 493.
- on business basis, (44) 691.
- on hills of England and Wales, treatise, (49) 491.
- partnerships in Spain, (50) 391.
- plans for Piedmont section of Georgia, (49) 189.
- policy and commodity prices, (49) 692.
- profit sharing in, (41) 194.
- Russian, under the Soviet, (50) 794.
- suggestions to settlers, (41) Calif. 91.
- systems for south Georgia, (49) 189.
- textbook, (46) 696; (50) 94.
- treatise, (41) 192, 331, 592; (43) 93, 396; (44) 794; (48) 297.
- types in Nebraska, (41) Nebr. 386.
- types in United States, (49) U.S.D.A. 592.
- types, labor income, (43) 92, W.Va. 92.
- types, relation to types of tenancy, (49) Iowa 793.
- without manure, (47) 25.

Farms—

- and ranches, Government, homesteading, (46) 91.
- animal power on, (46) 99.
- buying with land-bank loans, (45) U.S.D.A. 692.
- changing conditions on, (49) 195.
- Corn Belt, cost of using horses on, (48) U.S.D.A. 890.
- Corn Belt, motor trucks on, (49) U.S.D.A. 185.
- Corn Belt, tractors for, (48) U.S.D.A. 888.

Farms—Continued.

- Corn Belt, tractors on, changes due to, (48) U.S.D.A. 786.
- Corn Belt, tractors v. horses on, (48) U.S.D.A. 786.
- demonstration, cost of production on, (45) N.Dak. 293.
- Egyptian, study of, (41) 493.
- electric power plant for, (44) 486.
- family supplies furnished by, (42) 895.
- fire control on, (42) 789.
- in Brandenburg, returns, (50) 890.
- in undeveloped regions, purchasing, (50) U.S.D.A. 591.
- lighting systems for, (50) 589.
- near Washington, D. C., economic study, (43) U.S.D.A. 691.
- North American, factors affecting size, (50) 89.
- number in United States in 1920, (44) 892.
- on drained marsh land, (50) Wis. 792.
- on South Dakota ranges, (48) 593.
- open field, of England, inclosure, (44) 890.
- outlet drains for, (49) Wis. 285.
- owned v. tenant, (49) Wis. 690.
- paying for themselves, (44) 487.
- planning size and shape of fields, (45) Wis. 189.
- poultry, in New Jersey, (41) N.J. 75.
- purchasing from farm earnings, (50) 593.
- purchasing, initial payment required, (46) 388.
- share-renting, (41) 592, 791.
- successful, cost data, (49) N.Y.Cornell 690.
- use of electricity on, (41) 489; (43) U.S.D.A. 486.
- use of horse power on, (43) U.S.D.A. 483.
- vacant, colonizing in France, (48) 92.
- water supply installations, (48) 786.
- Farmstead, plans, (44) U.S.D.A. 87.
- Farmsteads, beautifying, U.S. D.A. (42) 838; (44) 698.
- Fasciation—
 - in plants, studies, (42) 332.
 - inheritance of, (44) 819.
 - transmission of, (45) 32.
- Fasciola—
 - gigantica, structure and life history, (45) 584.
 - hepatica infection, complement fixation reaction in, (49) 77.
 - hepatica, notes, (44) 184.
 - revision, (45) 160.
- Fasting, effect on blood regeneration, (44) 564.
- Fat—*see also* Oil.
 - absorption methods, (48) 759.
 - analysis, (44) 412; (47) 805.
 - analysis and chemistry, (42) 7.
 - analysis, official method, (44) 9.

Fat—Continued.

- analysis, temperature of solution applied to, (41) 314.
- analysis, treatise, (49) 608.
- and protein ratio in the diet, (41) 669.
- associated with starch, (44) 111; (45) 611.
- chemistry, monograph, (48) 807.
- chemistry, progress in, (43) 201; (45) 203; (46) 613.
- chemistry, review of literature, (43) 112.
- constants, relationship, (48) 502.
- determination, (41) 116, 311.
- determination in—
 - butter, (43) Ind. 805.
 - butter, apparatus for, (48) 807.
 - buttermilk, (50) 10.
 - casein, (49) 609.
 - cocoa and chocolate, (41) 714.
 - feces, new method, (42) 506.
 - flour, (45) 13.
 - food and soap, (48) 805; (50) 614.
 - sour milk, (45) 207.
- effect on diabetes and insulin requirement, (50) 767.
- excess, effect on growth of tadpoles, (46) 565.
- excess, relation to iodine requirements and thyroid, (50) 865.
- excretion, (48) 161.
- extraction apparatus, (41) 113; (42) 207.
- extraction test, denatured alcohols for, (49) Wis. 611.
- free diets, metabolism experiments, (46) 255.
- importance in animal feeding, (50) 267.
- in blood in avitaminosis, (50) 860.
- in blood in the Tropics, (41) 764.
- in blood of fowls, (41) 773, 774.
- in casein, analyzing and removing, (49) 609.
- in diet, digestibility, (42) 757; (44) 666; (45) 164; (46) 565.
- in diet, effect on tadpoles, (41) 468.
- in diet, minimum, (41) 468; (42) 165.
- in dried potato preparations, (43) 414.
- in human milk, (49) 275.
- in milk, inheritance, (49) 877.
- in skim milk, methods of determining, (43) N.Y.Cornell 415.
- industry in France, (43) 261.
- industry in 1914–1918, (43) 112.
- metabolism—
 - in avitaminosis, (50) 860.
 - of infants, (42) 60, 555.
 - relation to accessory substance, (41) 559.
 - rôle of cholesterol, (45) 367.
 - studies, (47) 366.
- necrosis in cattle, (46) 683.
- production, biotechnology, (42) 263.
- production from protein, (48) 161.

Fat—Continued.

- production in plants, (43) 430.
- requirements, minimum, of infants, (45) 163.
- requirements of children, (47) 766.
- rôle in protein utilization, (41) 670.
- storing by evergreen foliage, (42) 433.
- transformation into carbohydrate, (48) 561.
- transport in animal body, (46) 861.
- utilization for muscular work, (41) 563.
- Fatigue, blood and urine changes due to, (41) 860.
- Fatigue, chemical factors in, (46) 475.
- Fats—
 - absorption by fried batters, (44) 662.
 - acetyl index, (47) 504.
 - acetyl value, determination, (45) 716; (50) 11.
 - and carbohydrates in nutrition, (49) 362.
 - and oils, chemical properties, (45) 464.
 - and oils, inspection, (47) Conn.State 559.
 - and oils, inspection and analysis, (45) Conn.State 365.
 - and oils, unsaponified matter, (50) 196.
 - animal and vegetable, statistics, (47) 711.
 - animal, digestibility, (41) U.S.D.A. 65.
 - animal, factors affecting composition, Kans. (46) 476; (49) 464.
 - animal, international trade, (46) 675.
 - animal, rôle in nutrition, (41) 669.
 - animal, treatise, (45) 203.
 - animal, vegetable fats in, (47) 14.
 - antiscorbutic factor in, (49) 58.
 - as source of muscular energy, (44) 463.
 - catalytic reduction with palladium, (42) 409.
 - chemistry of, (48) 107.
 - chemotherapeutic studies, (46) 579.
 - determination in cereals, (45) 206.
 - digestibility, (46) 758; (49) 560.
 - dry rendering, (50) 112.
 - edible, treatise, (47) 311.
 - effect on elimination of endogenous uric acid, (49) 662.
 - effect on nitrogen distribution in urine, (49) 257.
 - effect on streptococci growth, (48) 658.
 - effect on thyroid glands of pigeons, (50) 668, 865.
 - extraction from leather, (46) 114.
 - factors affecting composition, (46) Kans. 476.
 - glycerol from, (42) 757.
 - hardened, nickel and arsenic content, (42) 610.
 - hardened, nutritive value, (41) 361, 362.

Fats—Continued.

- hydrocarbon, treatise, (48) 206.
 - hydrogenated, digestibility, (47) U.S.D.A. 560.
 - hydrogenated, manufacture, (45) 317.
 - hydrolyzed, analysis, (45) 614.
 - in apple trees, (43) N.H. 28.
 - in Germany before and during the war, (42) 362.
 - in Germany in wartime, (42) 552.
 - iodin number, determination, (46) 709.
 - iron content, (43) 202.
 - Kreis test, quantitative aspects, (50) 713.
 - melting point determination, (46) 13.
 - moisture content, determination, (44) 713.
 - nutritive value and significance, (45) 163. .
 - nutritive value in relation to vitamin A content, (46) 256.
 - nutritive value, relation to color, (44) 765.
 - of coconut group, method of estimating, (43) 315.
 - production and consumption in United States, (43) 61.
 - proteins, and carbohydrates, unusual proportions in diet, effect, (49) 360.
 - rancid, compounds developed in, (50) 609.
 - rancidity detection, (42) 505; (44) 13.
 - rancidity in, characteristics and causes, (49) 410.
 - rancidity in, test, (48) 711.
 - relative values, (50) 852.
 - replacement of glycerol by higher alcohols, (42) 757.
 - saponification number determinations, (43) 505.
 - shortening powers, (49) 455.
 - shortening value, (46) 258.
 - substitutes in Germany, (43) 204.
 - synthesis of, (42) 409.
 - table of refractive indices, (45) 802.
 - treatise, (47) 292.
 - use in pastry making, (48) 258.
 - used for frying, changes in, (44) 662.
 - vegetable, coefficients and digestibility, (49) 560.
 - vegetable, digestibility, (42) 552; (43) 64.
 - vegetable, in animal fats, (47) 14.
 - vegetable, treatise, (41) 110.
 - vegetable, vitamin A content, (49) 59.
 - vitamin A in, effect of ozone, (45) 564.
 - vitamin A in, relation to yellow pigments, (46) 61.
- Fatty acid-glycerin mixture, predominance in diet, effects, (49) 359.
- Fatty acids—
- addition to mineral oils, effect, (47) 292.
 - as food, (41) 361. 362.
 - determination, (41) 112.

Fatty acids—Continued.

- determination in butter fat, (49) 678.
 - melting point determination, (46) 13.
 - nephelometric values of, (42) 505.
 - of different molecular weight, identification, (42) 416.
 - retarding action, (42) 310.
 - volatile, production by propionic acid bacteria, (50) 279.
- Fatty residues, analysis, (44) 412.
- Fauna of British India, (43) 50.
- Fauna of British India, treatise, (46) 461.
- Favolus europaeus, description, (42) 51.
- Feather mite, notes, (49) 848. *
- Feathers—
- and feather pigments, morphology, (49) 574.
 - blue color in, cause of, (42) 768.
 - causes of whiteness in, (46) 264.
- Feces—
- bacteriological examination, (43) 113.
 - calcium determination in, (46) 417.
 - catalase concentration in, (41) 409.
 - detecting eggs of parasites in; (48) 383.
 - ether extract of, (50) 804.
 - fat determination in, new method, (42) 506.
 - floral content, of children, (42) 260.
 - floral content, of infants, (46) 571.
 - human, H-ion concentration, (48) 62.
 - magnesium determination in, (46) 417.
 - of imported dogs, (42) 180.
 - of infants, studies, (42) 60; (47) 463.
 - potassium determination in, (46) 417.
 - sodium determination in, (46) 417.
 - zinc content, (42) 710, 758.
- Federal—
- aid, Massachusetts attack on, (48) 895.
 - Board for Vocational Education, history and activities, (47) 694.
 - Board for Vocational Education, report, (47) 396.
 - departments as source of information for libraries, (42) 594.
 - Farm Loan Act—
 - amendments, (50) 793.
 - constitutionality, (45) 693, 896.
 - for Porto Rico, (43) 291.
 - suggested amendments, (42) 689.
 - Farm Loan System, (47) Ill. 492.
 - Farm Loan System, treatise, (46) 388.
 - farm loans, (43) 394.
 - farm loans, plans for use, (42) 87.
 - Food and Drugs Act, enforcement, (43) 662.
 - Food Control Act, outline, (48) 391.
 - Highway Act, rules and regulations, (48) U.S.D.A. 487.
 - Horticultural Board, activities on Texas border, (45) 253.
 - Insecticide Act, (44) 801.
 - land bank bonds, future of, (42) 689.

Federal—Continued.

reserve banking systems, credit and agriculture under, (48) 389.

Feed—

cost of milk and fat production, (49) Ill. 576.

flour, standards for, (49) 65.

mixtures, quantitative analysis, (46) 71.

unit, Scandinavian, (49) 72.

units for domestic animals, (48) 857.

units, significance in determining value of feeding stuffs, (49) 166.

Feeding—

and calculation of rations, principles, (46) 696.

cake and corn, manurial value, (41) 826.

cakes, rancidity, (41) 10.

charts, (41) 270.

equipment for cattle, (47) Iowa 891.

experiments—*see also* Cows, Pigs, *etc.* financial phases, (46) Ill. 365; (47) 76.

probable error in, (48) 128.

new suggestions, (47) 866.

racks for alfalfa hay, design, (43) 91.

racks, plans, (42) Mont. 86, 285.

science of nutrition as guide, (46) 871.

standards, Wolff-Lehmann, modified, (41) 367.

Feeding stuffs—*see also specific kinds.*

amino acids in, (46) 504.

analyses—*see also* Feeding stuffs, inspection and analyses.

analyses, (41) 270; (44) Hawaii 71, U.S.D.A. 176, Ariz. 568, Mich. 568;

(45) Tex. 68, Ind. 266, N.J. 774, Mich. 899; (46) Can. 167, Mich. 168, Tex. 675; (47) N.J. 570; (48) Can. 368.

analyses and price, (47) 274, Ind. 473.

analyses in Florida, (46) 871; (47) 668.

analyses in New York, (49) 167.

analyses in Ohio, (49) 66.

analyses in Pennsylvania, (43) 867.

analysis, methods, (45) 109.

analysis, official method, (44) 9.

and feeding, treatise, (47) 374; (48) 660.

Australian, analyses and digestibility, (45) 468.

Bacillus botulinus in, (49) 860.

Canadian, for beef production, (49) Can. 67.

Canadian usage in definition, (45) 375.

castor bean meal in, (44) 205; (45) 413.

chart, (42) 770.

chemistry of, (50) 266.

chemistry of, treatise, (43) 609.

chemistry, progress in, (41) 201.

commercial, for pigs, feeding value, (49) Iowa 572.

Feeding stuffs—Continued.

commercial v. home mixtures for pigs, (49) Can. 68.

composition and classification, (46) 70.

composition and retail price, Conn. State (44) 176; (47) 570.

composition, relation to milk production, (49) N.Y.Cornell 577.

concentrated, production and use, (43) 170.

condimental, (41) N.Dak. 673.

condimental, analyses, Ind. (43) 69, 867.

conservation, (50) 865.

containing cellulose, digestibility, (43) 670.

definitions, (41) 673, N.Dak. 673; (47) Conn.State 570; (49) 66.

definitions and law in Minnesota, (48) 68.

determining value, (49) 166.

diagnostic characteristics, (50) Mich. 714.

differentiation by serum reactions, (43) 206.

digestibility, (42) Tex. 369; (47) Tex. 472; (48) 398; (50) Mass. 168.

digestibility, relation to size of ration, (47) 271.

digestion coefficients, (43) 266.

digestion experiments, errors in, (49) 864.

drying, (42) 417; (43) 15.

economy in, (43) Wash. 698.

effect on milk production, (47) 378.

energy value in Germany, (47) 69.

fertilizer constituents, (42) Mass. 866.

for dairy cows, (42) Calif. 71, Ohio 496.

for horses in Hawaii, (45) 573.

from plants in Germany, (43) 170.

from waste sulphite liquor, (42) 615.

from white pine sawdust, (45) 202.

green, effect on milk production, (44) 776.

home grown, starch equivalent unit, estimating, (50) 268.

in Germany, war-time sources, (47) 278.

inspection, (44) Me. 470; (46) Vt. 572; (49) R.I. 370, Ind. 771.

inspection and analyses—*see also* Feeding stuffs, analyses.

inspection and analyses, (41) N.H. 68, Conn.State 176, Can. 564, Ind. 564,

R.I. 564, Ind. 868, N.Y.State 868; (42) Me. 63, Mich. 63, 263, 560, 769,

Ind. 769, N.H. 769, Tex. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373,

Vt. 464, N.J. 671, R.I. 672, 867; (44) Mass. 671, N.H. 671; (45) N.Y.State 469, 872, Vt. 872;

(46) Ky. 572, Me. 572, N.H. 674; (47) Mass. 274, R.I. 571; (48) Me. 68, Mass. 568, N.H. 568, Tex. 568,

Vt. 660; (49) 66; (50) Conn. State

Feeding stuffs—Continued.

- inspection and analyses—continued.
 - 169, Me. 268, N.J. 367, Vt. 367, Mass. 774.
- inspection and analyses—
 - in Michigan, (50) 169.
 - in Minnesota, (48) 68.
 - in North Carolina, (50) 169.
 - in West Virginia, (50) 169.
 - in Wisconsin, (50) 573.
- international trade, (41) 176; (43) 170.
- labeling as to nutritive value, (42) 253.
- law, (41) Tex. 564; (42) Tex. 370; (43) Tex. 867; (45) Tex. 68; (47) Conn.State 570.
- law, enforcement, (50) Kans. 65.
- law in Indiana, (41) Ind. 564.
- law of diminishing returns, application, (49) 89.
- law, revision, (43) N.J. 373.
- low-grade, (42) Mass. 866.
- manufactured, (49) 66.
- method for valuation, (43) 315.
- method of balancing, (48) 67.
- microscopic analysis, (42) 469; (50) 468.
- microscopic control of, (43) 170.
- mineral, for farm animals, Ohio (44) 175; (45) 573.
- mixed, attitude of experiment stations toward, (47) 278.
- money value, calculation, (46) 70.
- new African, analyses, (48) 68.
- new type of sampling horn for, (47) 804.
- nitrogenous constituents, (41) 367.
- nonprotein nitrogen in, (42) 469; (48) 771.
- nutritive value, (41) 270; (43) 372.
- of South Africa, analyses, (45) 775.
- official samples, composition, (47) N.Y.State 172.
- pectin content, (44) 111.
- preserved, acid content, (48) 568.
- prices, (43) N.J. 69, N.J. 672; (47) Mass. 274.
- prices, wholesale, (44) Mass. 671.
- process for reducing fiber content, (43) 868.
- proprietary, labeling, (44) 363.
- protein analyses, (42) 210.
- protein values, (48) 398; (50) 775.
- public formulas for, (43) 671.
- quantitative microanalysis, (43) 14.
- reports of feed control officials, (41) 564; (44) 364.
- salt detection in, (48) 712.
- selection, (46) 70.
- sodium chlorid content, (45) Tex. 14.
- substitutes in Germany, (43) 204.
- sugar content, (43) 671.
- unusual, analyses, (41) Ariz. 367.
- utilization of residues in, (47) 612.
- valuation, (45) 373, 379, 616.
- vitamins in, (47) 464; (49) 265.
- wartime, (43) 170.

Feeding stuffs—Continued.

- wartime, composition and digestibility, (43) 267.
- wartime, in Germany, (42) 369.
- with cellulose, evaluation and digestibility, (46) 68.
- woody materials in, use, (48) 568.
- Feeds, *see* Feeding stuffs.
- Feijoa, culture, (44) Ariz. 532.
- Feldspar, potassium content, (50) 521.
- Feltia annexa, poison bait for, (43) Ariz. 757.
- Fen soils, claying, (46) 216.
- Fence posts—
 - concrete, studies, (49) Iowa 788.
 - creosoting, (44) 87; (48) Mo. 680, 783, Mo. 885.
 - durability, (48) Mo. 885; (49) Mich. 84.
 - of Louisiana woods, tests, (44) 87.
 - steel and concrete, (43) Ohio 391.
 - treated and untreated, tests, (47) 290.
 - treatment, (41) 584, 585, Mo. 652; (42) S.C. 85; (46) 383, Iowa 383; (47) Iowa 790; (48) Mo. 680.
 - willow, treatment, (43) U.S.D.A. 391.
- Fences—
 - concrete, construction, (43) 188.
 - farm, construction, (46) 491.
 - on western ranges, (47) 278.
 - portable, plans, (42) 285.
 - wire, for pastures, (42) 282.
 - woven wire, construction, (44) 588.
- Fencing, farm, (41) 585.
- Fennel, culture and preparation of products, (50) 140.
- Fenugreek seeds, oil from, (41) 803.
- Fermentation—
 - alcoholic, inhibition by preservatives, (42) 609.
 - alcoholic, treatise, (50) 806.
 - chemistry, progress in, (41) 201, 508, 801.
 - industries, 1914 to 1919, (44) 714.
 - reactions, mechanism of, (45) 220.
 - tube, modified, (43) 611.
- Fermentations, abnormal, in milk, (50) Ohio 580.
- Ferments—*see also* Enzymes.
 - digestive, (41) 781.
 - digestive, in calf fetus, (44) 865.
- Fern—
 - containing hydrocyanic acid, (41) 633.
 - horsetail, eradication, (44) Oreg. 826.
 - leaf roll, cause, (47) 749.
 - leaf scorch, (46) 647.
 - scale, control, (48) 852.
 - silver, eradication, (44) 144.
 - weevil, Australian, notes, (42) 549.
 - weevil, Australian, parasite of, (48) 857.
 - weevil in Hawaii, (45) 755.
 - weevil, notes, (46) 58.
 - weevil parasite in Hawaii, (48) 158.
- Fernow, B. E., biographical sketch, (48) 399, 840.

Ferns—

- collecting, (42) U.S.D.A. 724.
- culture, (50) 240.
- dictionary of, (43) 148.
- evolution of chondriome in, formation of sporangium, (45) 31.
- hardy native, for Missouri, (43) 838.
- insects affecting, in Hawaii, (48) 853.
- poisonous to stock, control, (42) 879.
- polyembryony in, (49) 425.
- sexual organs, cytological study, (45) 30.
- sporangium in, cytological study, (50) 223.

Ferric hydroxid, fertilizing value, (42) 222.

Ferrocyanids of sodium and potassium for seed disinfection, (47) 45.

Ferrous—

- oxid, effect on wheat, (46) 717; (48) 324.
- sulphate, effect on sulphate leachings, (50) 523.
- sulphate treatment of soil, (46) 812.
- sulphid formation in hard-boiled eggs, (43) 458.

Fertility—

- in rats as affected by inbreeding, (41) 865.
- use of term, (42) 529.

Fertilization—

- acid and alkaline, effect on crops, (48) 424.
- and plant analysis, (44) 815.
- problems, (42) 262.
- profitable, application, (44) 796.
- rôle of egg and sperm cells in, (48) 567.
- system, new, for German soils, (48) 821.
- with cyanid nitrogen, (44) 216.
- with raw humus, (48) 22.
- without manure, (47) 25.

Fertilizer—

- chemistry, progress in, (41) 201.
- complete, fertilizing value, (49) 834.
- dealers, list, (41) Iowa 24; (45) Calif. 27.
- distributors, (50) 589.
- experiments—*see also special crops.*
- experiments, (41) Mass. 21, Ark. 130, Del. 130, Can. 516; (43) Can. 726, Can. 727; (44) N.Dak. 88, U.S.D.A. 127, Minn. 321, 626, Ala.Col. 722; (46) U.S.D.A. 130, N.H. 318, 818; (47) S.C. 23, Mich. 124, Minn. 124, Minn. 319, Ark. 519, Ark. 725, 726; (48) Can. 322, Mo. 615, Mass. 620, Pa. 818; (49) Pa. 214, 516, Ohio 724, 814, 834.

experiments—

- analysis of results, (47) Pa. 640.
- as affected by size and arrangement of plats, (44) 214.
- at Pusa, (50) 210.
- conclusions, (42) Ohio 516, Wash. 517.

Fertilizer—Continued.

experiments—continued.

- in Canada, (48) 23.
- in Delaware, (47) 814.
- in Dutch East Indies, (45) 622.
- in Germany, (42) 516; (47) 816.
- in Iceland, (48) 31.
- in India, (42) 218, 518; (47) 24.
- in Iowa, (42) 516.
- in Java and Sumatra, (47) 24.
- in Netherlands, (42) 123.
- in Texas, (44) 815.
- long-time, on same soil, value, (42) 720.
- method of pot cultures in, (48) 455.
- methods, (44) 512; (47) 22.
- on Borbhetta soil, (42) 22.
- on Caribou loam, (41) Me. 130.
- on grasslands and pastures, (46) 131.
- on irrigated lands, (44) 380.
- on mountain prairie soils, (41) 722.
- on Palouse silt loam, (43) Idaho 227.
- on peat bogs, (43) 23.
- on sand hill land, (41) 813.
- on seed beds, (42) 518.
- results, study, (44) 626.
- short-time, unreliability of, (43) 822.
- variation in yield of check plats, (48) 636.
- with crop rotation, (41) N.Y. Cornell 21; (43) Ky. 814; (45) Mo. 517.
- formulas for Georgia soils, (43) 727.
- handbook, American, (49) 422.
- industry—
 - directory, (50) 220.
 - effect of agricultural depression, (47) 296.
 - effect of railway rates, (46) 522.
 - in Germany, regulations, (49) 819.
 - in Sweden, (49) 727.
 - in United States, (47) 418.
 - present tendencies, (43) 817.
 - relation to experiment stations, (46) 522.
 - review, (44) 627.
 - survey, (42) U.S.D.A. 19.
- law, (42) Mass. 23; (43) N.H. 28, Conn.State 326, Ind. 631; (48) Oreg. 823; (49) Me. 218; (50) Conn.State 626, Mo. 626.
- law in—
 - Canada, (49) 125.
 - Georgia, (45) 522; (46) 522.
 - Illinois, (43) 28.
 - Kansas, (49) Kans. 518.
 - Maryland, (41) 724.
 - Michigan, (49) 422.
 - New Jersey, (41) N.J. 630.
 - Pennsylvania, (42) 331; (43) 326; (45) 523.
 - Porto Rico, (44) 25.

Fertilizer—Continued.

- law in—continued.
 - Tennessee, (45) 523.
 - West Virginia, (50) 124.
 - laws of Spain, (49) 214.
 - laws, State, officials in charge, (43) 817.
 - manufacturers and dealers, (43) 817; (47) 728.
 - materials, moisture determinations, (44) 801.
 - materials, prices, (45) 730.
 - materials, retail prices, report, (42) U.S.D.A. 331.
 - mixtures and composts, (42) 721.
 - needs of crops, estimating, (47) 22.
 - plate experiments, (50) N.Y.State 421, Pa. 422.
 - plats, permanent, at Coimbatore, (50) 214.
 - registrations in New Jersey, (49) N.J. 422.
 - requirements, determination, (44) 215.
 - resources of Italy, (43) 728.
 - salts, effect on transformations in soil, (45) 725.
 - situation in United States, (45) 729.
 - spreaders, lime nitrogen, tests, (46) 188.
 - studies, experimental technique in, (47) 814.
 - studies with composts, (49) Ga. 516.
 - supply of southern India, (41) 131.
 - trade in Massachusetts, (48) Mass. 522.
 - treatment, effect on evaporation, (50) 812.
- Fertilizers—*see also specific material.*
- action and time of application, (49) 517.
 - analyses, (41) 428, 724; (43) Md. 122; (45) Mich. 899; (49) Mo. 23, 218, Me. 218; (50) 10.
 - analyses—*see also* Fertilizers, inspection and analyses.
 - in Florida, (49) 218.
 - in Georgia, (46) 522.
 - analysis, official method, (44) 9.
 - analytical methods, (50) 412.
 - and land values, (49) 792.
 - and soils, (47) Minn. 319.
 - animal, use, (42) 328.
 - as affected by soil acidity, (43) 212.
 - as affected by the war, (43) N.Y.State 626.
 - at present prices, profits from, (45) 894.
 - average analyses, (44) N.J. 322.
 - bacterial analyses, (43) 424.
 - before and after the war, (48) 517.
 - borax in, (43) 312, 613; (44) Va. 712.
 - borax in—
 - determination, (42) 313.
 - effect on crops, (42) U.S.D.A. 816; (43) S.C. 126, Ind. 325; (44) Me. 129, 423.
 - boron in, determination, (45) 426.

Fertilizers—Continued.

- chemical, manufacture and use, (44) 128.
- chemical terms used with, (50) 220.
- combined, effect on yield of oats, (42) 719.
- commercial, and phos-pho-germs, comparison, (43) 27.
- comparison, (50) R.I. 520.
- composition and cost, (47) N.Y.State 418.
- composition and prices, (49) N.Y.State 325.
- composition and use in Spain, (49) 214.
- concentrated, economics of, (50) 322.
- concentrated, use and preparation, (48) 818.
- consumption, cost, and use in Spain, (50) 125.
- consumption in United States, (43) 425.
- cost in 1919, (43) Vt. 428.
- cyanamid in, (46) 717.
- date of application to cotton, (42) 438.
- definitions and standards, (50) 197.
- dicyandiamid in, (44) 711; (45) 804.
- diffusion of, (50) N.J. 216.
- effect on—
 - cereals, (48) R.I. 518.
 - composition of cherries, (46) 736.
 - composition of crops, (41) 422, 813.
 - pH of soils, (43) 423.
 - productiveness of soils, (44) N.Y. State 320.
 - soil acidity, (47) 723.
 - soil aldehydes, (43) Pa. 519.
 - soil solubility, (41) Mich. 512.
 - sulphur and phosphorus in tomatoes, (49) 436.
 - wheat stem rust, (50) 549.
 - yield and market condition of corn, (47) 530.
 - yield and maturity of soy beans, (47) 531.
- efficiency of, (46) R.I. 217.
- examination, (41) 423.
- experiment station research in, (49) 105.
- for Cochín China, (41) 428.
- for crops and soils, (50) Del. 18.
- for crops in North Carolina, (45) 815.
- for Indiana, (41) Ind. 218.
- for lawn and garden, (49) West.Wash. 97.
- for Maryland soils, (47) Md. 418.
- for spring crops, (49) Mich. 19.
- for vegetables in Egypt, (45) 816.
- from city refuse, (49) 215.
- from peat, (41) 722.
- from sugar cane megass, (44) 513.
- from waste sulphite liquor, (42) 615.
- functions and uses, (46) 19.
- higher analysis formulas, (46) 522.
- high-grade, use, (45) 816.
- high-grade, value of, (43) Mich. 626.

Fertilizers—Continued.

- home mixed, analyses, (43) N.H. 520.
- home mixing, (41) U.S.D.A. 626; (47) 816.
- information for Porto Rico, (41) 326.
- injurious effects on plants, (43) 513.
- insoluble phosphoric acid in, (50) 712.
- inspection and analyses—*see also* Fertilizers, analyses.
- inspection and analyses, (41) Mich. 24, N.H. 24, N.J. 24, Kans. 132, N.Y. State 219, Ind. 630; (42) S.C. 23, Calif. 223, Me. 223, N.J. 432, R.I. 526, Tex. 527, Mass. 817; (43) Ky. 28, N.H. 28, Mo. 129, N.J. 129, Oreg. 129, Conn.State 221, Mich. 326, N.J. 326, Vt. 428, N.Y.State 520, Kans. 729, Ind. 818; (44) Me. 423, R.I. 423, Ky. 516, Conn.State 725, Mo. 819; (45) Calif. 27, N.J. 27, Tex. 27, N.H. 122, N.J. 217, Ind. 522, Mass. 522, N.Y.State 626, Mich. 818, Vt. 818; (46) S.C. 124, Tex. 124, R.I. 221, Ky. 322, Conn.State 522, Vt. 522; (47) Mo. 27, N.J. 27, N.J. 28, Me. 125, N.H. 125, Mass. 221, Ind. 625, Ky. 728, S.C. 819; (48) Tex. 220, R.I. 429, Mass. 522, N.H. 623, N.J. 623, Vt. 623, Oreg. 823; (49) Conn.State 124, N.J. 325, Kans. 518; (50) Kans. 20, S.C. 20, Ky. 324, Vt. 324, Conn.State 626, Me. 626, R.I. 626, Mo. 821.
- inspection and analyses in—
 - Arkansas, (45) 522; (49) 818.
 - California, (49) 727.
 - Canada, (42) 724.
 - Florida, (42) 817; (43) 817; (45) 217; (46) 430.
 - Georgia, (45) 522.
 - Illinois, (43) 28.
 - Indiana, (49) Ind. 727.
 - Louisiana, (42) 23; (44) 725; (45) 522.
 - Maryland, (42) 223; (43) 221.
 - Michigan, (49) 422.
 - North Carolina, (42) 223, 526; (43) 28, 428, 818; (44) 130; (45) 522, 730; (48) 522.
 - Ohio, (49) 124.
 - Pennsylvania, (42) 331; (44) 130; (45) 523; (50) 821.
 - Porto Rico, (42) 626; (44) 25; (45) 818; (46) 823.
 - Tennessee, (45) 523.
 - Virginia, (42) 817, 818; (43) 521, 631.
 - West Virginia, (50) 124.
- inspection—
 - and control, (42) 526.
 - in Maryland, (41) 724.
 - in Porto Rico, (41) 327.
 - in Spain, (42) 526.
- inspections from 1880 to 1921, (47) N.J. 522.
- international movement, (41) 327.

Fertilizers—Continued.

- law of diminishing returns, application, (49) 89.
- law of physiological relation in, (46) 318.
- location in respect to seed, effect, (50) N.J. 216.
- manufacture and function, (43) 424.
- manufacture, treatise, (46) 518.
- manufacturers, directories, (46) 430.
- marine, use, (45) 121.
- methods of applying, (49) Wis. 622.
- mixed, value, (50) 121.
- moisture determination, (44) 802.
- new, (46) 124.
- new, action and use, (43) 125.
- New England Standard Nine, use in Massachusetts, (49) 726.
- new, experiments, (49) 623.
- new type of sampling horn for, (47) 804.
- nitrite-containing, nitrogen in, (48) 109.
- "nitrogen bacteria," tests, (43) 221.
- nitrogen determination in, (41) 228; (43) 714.
- on muck soil, (47) 725.
- orchard, studies, (43) Oreg. 145.
- organic, bacterization, (42) 520.
- organic, production of carbon dioxide in soils by, (46) 321.
- pamphlet of popular information, (41) 813.
- penetration in soils, (44) Calif. 722.
- pepto-humic and organic, tests, (44) 420.
- phosphoric acid in, (48) 503.
- physiological values in, (46) 318.
- potash determination in, (50) 412.
- production and use in Egypt, (42) 127.
- production and use in Japan, (42) 218.
- production in South Africa, (42) 21; (45) 121.
- purchasing suggestions, (42) Wash. 397.
- radioactivity of, measuring, (49) 217.
- raw materials in Southern States, (42) 525.
- registered brands, (46) 24.
- registrations for—
 - 1919, (41) N.J. 25.
 - 1920 in Pennsylvania, (43) 326.
 - 1921, (45) N.J. 332.
 - 1922, (47) N.J. 221.
- regulations, (42) U.S.D.A. 128.
- relation to crop production, (42) Va. 21.
- relation to food production, (42) 20.
- relation to soil fertility, (42) 515.
- sampling, (41) 800.
- sampling and analysis in Spain, (49) 214.
- selection—
 - and mixing, (43) 727.

Fertilizers—Continued.

selection—continued.

- and use, (44) Wash. 626; (45) 24; (50) 322.
- on basis of soil reaction, (45) 330.
- purchase, and use, (49) Mo. 23.
- sources and manufacture, treatise, (44) 22.
- spray application, Hawaii, (41) 138, 148.
- standard for Michigan, (48) Mich. 621.
- standard formulas and use, (50) Tex. 220.
- studies, (47) R.I. 725; (49) Miss. 414.
- textbook, (42) 719.
- time and method of applying, (48) S.C. 621.
- trade and fraud in, (41) 219.
- treatise, (41) 21, 423, 624, 626; (45) 24; (48) 721.
- urea in, (45) 804.
- use, (44) Mich. 815; (45) Ohio 119; (46) 424; (47) 216.
- use in—
 - Canada, (41) 626.
 - Germany, (42) 515.
 - India tea districts, (42) 518.
 - New Jersey, (42) 291.
 - Rhodesia, (41) 814.
 - South Australia, (46) 20.
- use on—
 - dairy farms, (47) Wis. 320.
 - pastures, (42) 720.
 - sandy soils, (42) Wis. 327.
- uses, collected leaflets, (48) 818.
- v. manure, (48) Can. 218.
- v. manure for crops, (46) 623.
- v. manure for market gardening, (43) R.I. 643.
- v. manure for Maryland soils, (43) 815.
- value, (49) Iowa 723.
- value, unit method of estimating, (49) 737.
- world production and trade, (44) 424.
- yearbook, (43) 817; (46) 430; (47) 728.

Fertilizing, formation in egg, (42) 262.

Fertilizing elements in soil, mathematical analyses of effect, (50) 214.

Fescue, meadow—

- breeding experiments, Can. (48) 31; (50) 433.
- culture and use, (42) U.S.D.A. 136.
- culture experiment on drained bog soil, (42) 29.
- culture experiments, (43) Wash. 436, Minn. 823.
- duration in meadows, (50) N.Y.Cornell 231.
- early growth in alkali soil, (42) Utah 28.
- net blotch of, (50) 651.
- seed production, (45) 740.
- yields, (42) Minn. 826.

Fescues, culture experiments, (49) 735.

Feterita—

- analyses, (45) Okla. 433.
- culture experiments, (44) N.Dak. 524.
- digestibility, (50) Mass. 168.
- fodder, ground, analyses, (45) Tex. 68.
- head chop, analyses, (45) Tex. 68.
- kernels, composition, (48) U.S.D.A. 309.
- prussic acid content, (42) Fla. 830.
- resistance to alkali, (43) Ariz. 724.
- smut resistance, (41) Kans. 48, Mo. 654.
- spur, culture, (44) U.S.D.A. 36.
- spur, origin and description, (45) Tex. 233.
- variety tests, (42) Tex. 828.
- yields, (46) Mo. 326.
- yields of forage, (41) Ariz. 332.
- Fetus, growing, effect on milk production, (50) Ky. 873.
- Fetus, human, lineal growth, formulas, (50) 868.
- Fetuses in utero, dead, retention of, (44) 174.
- Fevers in the Tropics, (42) 174.
- Fiber—
 - agaves, poling in, (47) 33.
 - binder-twine, production in Philippines, (44) U.S.D.A. 527.
 - crops, (48) 130.
 - crops, culture experiments, (44) 733.
 - crops, culture in Cyprus, (44) 137.
 - crops, fertilizer experiments, (44) 733.
 - crops, studies, (50) 829.
 - crops, tests, (48) 629.
 - crops, variety tests, (44) 733.
 - from Bourbon palm, (42) 531.
 - from *Crotalaria usaramoensis*, (41) 640.
 - Furcraea*, (41) 641.
 - in rations for pigs, (47) 75.
 - in swine ration, effect, (49) Ohio 371.
 - industry in New Zealand, (47) 530.
 - industry in Philippines, (43) 826.
 - manila, for hoisting cables, tests, (42) 388.
- plants—
 - breeding experiments, (49) 735.
 - culture experiments, (41) 230, 529; (48) 434, 629.
 - culture in Cuba, (44) 735.
 - in Brazil, (41) 827.
 - in Burma, insect pests, (45) 657.
 - in Japan, (47) 33.
 - in Rhodesia, summary, (45) 535.
 - legislation in Tropics, (42) 599.
 - native in Sweden, (43) 828; (44) 435; (46) 532.
 - Philippine, (44) 231; (48) 842.
 - production in Cuba, (42) 31.
 - production in Germany, (44) 138.
 - seeds, nitrogen and oil in, (47) 128.
 - tests, (46) 227.
 - variety tests, (41) Hawaii 138.

Fiber—Continued.

production in South Africa, (41) 532.
ropes, mechanical properties, (42) 782.

Fibers—

analyses, (43) 828.
animal, used in textiles, (46) 770.
breeding data, recording, (44) 521.
cell wall structure, (50) 629.
chemistry of, progress, (41) 613.
culture experiments, (45) 532.
determination of flexibility, (46) 230.
estimation in paper, (42) 12.
from abaca, comparative study, (50) 638.
of Philippine dipterocarps, (46) 445.
Philippine, grading, baling, and inspection, (50) 434.
properties and uses, (50) 534.
sources and uses, (48) 239.
tests of samples, (45) 340.
textile, microscopic characteristics, (50) 434.
vegetable, use in paper making, (42) 116.

Fibrin—

digestion by trypsin, (42) 60.
hydrolytic cleavage products, separation, (50) 108.

Fibrocystis tarandi n.sp., description, (48) 151.

Ficaria verna, variation in, (42) 725.

Ficiomyia perarticulata n.g. and n.sp., description, (48) 459.

Ficus elastica, notes, (45) V.I. 150.

Fidia viticida, see Grape root worm.

Field crops—

breeding notes, recording, (44) 521.
cooperative experiments in Ontario, (46) 226.
cost of production, (41) Minn. 91; (42) Mo. 188; (43) Ohio 392.
cost of production in Colorado, (44) U.S.D.A. 789.
cost studies, (50) Can. 533.
courses, grades in, (48) 195.
courses in, standardization, (45) 90.
elementary course, standardizing, (48) 195.
exhibit, (43) Mich. 698.
fall seeded, (43) Wash. 738.
in Canada in 1917, (41) Can. 594.
in South Africa, (50) 333.
insects affecting, (43) Mo. 758; (47) 848.
inspection, official, (41) 536; (42) 530; (44) 233.
introductory course in, (47) 299.
irrigated, as hog pasture, (41) U.S.D.A. 72.
labor and material requirements, (46) U.S.D.A. 493.
laboratory instruction in, (48) 195.
manual, (41) 298, 331; (49) 31.
new forms, multiplication and distribution, (49) 130.
nomenclature of varieties, (46) 129.
of Burma, (41) 529.

Field crops—Continued.

of Ceylon, (41) 529.
seeds, labeling by seedsmen, (44) 233.
soil preparation for, (43) 321.
statistics, (50) 532.
teaching, (49) 194.
value of line selection, (41) 636.
varieties for dry land and irrigation, (49) Oreg. 526.
varieties for Wisconsin, (45) Wis. 431.

Field crops work—
at Reading, (46) 131.
in Africa, (48) 629.
in Antigua, (46) 226.
in Argentina, (45) 631.
in Assam, (41) 334; (42) 132.
in Australia, (43) 824; (44) 827; (48) 630.
in Barbados, (44) 433; (45) 431.
in Bengal, (42) 132; (45) 34; (49) 734.
in British Guiana, (41) 528; (44) 136; (45) 33; (46) 727; (50) 134.
in British Virgin Islands, (42) 230.
in Burma, (41) 528; (42) 436; (50) 231.
in Canada, (41) Can. 528; (43) Can. 734; (45) 630, Can. 822.
in Cuba, (42) 31.
in Cyprus, (44) 137.
in Denmark, (46) 436.
in Dutch East Indies, (41) 638; (44) 633.
in England, (44) 433; (46) 726; (48) 228; (50) 134.
in Fiji, (45) 34.
in Guadeloupe, (44) 433; (45) 734; (47) 824.
in Iceland, (48) 31.
in India, (41) 826; (42) 132; (44) 137, 433, 632, 633, 733; (45) 35, 532; (46) 131, 227, 436, 531, 634, 727, 831; (47) 32, 824; (48) 629, 732; (49) 31, 526; (50) 28, 433.
in Ireland, (45) 532; (47) 32; (49) 329; (50) 231.
in Java, (41) 639.
in Madras, (42) 436; (50) 433.
in Mesopotamia, (44) 527; (46) 436; (48) 630.
in Minnesota, Minn. (42) 825, 826.
in Montserrat, (44) 827; (46) 131; (50) 28.
in Mysore, (50) 433.
in Netherlands, (41) 638.
in New South Wales, (49) 329.
in Nigeria, (42) 436; (43) 637; (44) 433, 827; (46) 437; (49) 31, 734; (50) 828.
in North Wales, (44) 227; (47) 824.
in Northumberland, (41) 729.
in Nova Scotia, (41) 729; (44) 632.
in Ontario, (41) 333; (42) 229, 230; (45) 630.
in Philippines, (50) 733.
in Rhodesia, (42) 230; (45) 340; (47) 32; (48) 830.

Field crops work—Continued.

- in Scotland, (46) 227; (48) 228; (50) 433.
- in South Africa, (41) 528.
- in South Australia, (41) 529, 639; (43) 528.
- in Sweden, (48) 730.
- in Switzerland, (44) 632.
- in Tanganyika, (50) 433.
- in Tunis, (45) 735; (49) 31.
- in Uganda, (42) 32; (45) 340; (46) 634; (48) 630.
- in Union of South Africa, (46) 227.
- in Uruguay, (44) 526.
- in West Indies, (41) 528, 729, 825; (45) 33; (46) 226; (47) 32, 632; (50) 433.
- in Zurich, (41) 729.
- on the Gold Coast, (42) 230.

Field experiments—

- as affected by size and arrangements of plats, (44) 214.
- calculation of probable error, (45) 734; (50) 316.
- error and plat technique, (47) Mo. 329.
- errors in, (48) 830.
- heterogeneity as factor affecting yields, (43) 526.
- interpretation, (50) 827, 828.
- methods of labeling, (44) 228.
- papers on, (48) 195.
- permanence of differences in plats, (44) 631.
- probable error in, (41) 635; (43) 527; (48) 128; (49) 823; (50) 229.
- short-time, unreliability, (43) 822.
- standardization, (42) 28, 529; (46) 829; (50) 733.
- standardization, bibliography, (48) 830.
- technique, (44) 512; (45) 528, 529; (47) 814; (50) 432.
- with irrigated rice, technique, (50) 832.

Field—

- husbandry, cooperative experiments, (49) 825.
- layouts, diagrams, (42) 184.
- notes, outlines and systems of collecting, (49) 616.
- plat experiments, standards, (47) 22.
- plat yields, statistical study, (50) N.Y. State 432.

Fieldfare, food habits, (41) 454.

Fig—

- anthracnose, notes, (45) N.C. 443.
- borer, control, (45) V.I. 150.
- borer, notes, (42) 454; (45) 558.
- branch disease, studies, (46) 48.
- canker, notes, (44) Calif. 744.
- cuttings, preparation and treatment, (43) 238.
- die-back, notes, (43) 246.
- disease, new, (41) 750.
- diseases, (44) Calif. 744; (50) 751.
- experiment station in California, (42) 94.

Fig—Continued.

- family and Blastophaga, symbiosis, (44) 660.
- fly, black, studies, (41) 552, 553.
- midge, new and remarkable, (48) 459.
- preparations, analyses, (42) 162.
- smut, control, (48) Calif. 542.
- smut, studies, (41) 157; (48) 351.
- trees, effect of notching on yield, (50) 38.
- wasp, life history and habits, (43) Calif. 238.

Figs—see also Caprifigs.

- analyses, (43) Calif. 238.
- botany, distribution, and pollination, (48) 41.
- breeding experiments, (43) 439.
- canning and preserving, (47) 460.
- caprification, Calif. (42) 831; (43) 238.
- culture experiments, (42) 736; (43) 40, U.S.D.A. 339; (48) U.S.D.A. 235.
- drying, (41) 557; (45) Calif. 808.
- evaporation, (45) 720.
- for Yuma Mesa, (42) Ariz. 341.
- frost injury to, (48) Calif. 543.
- insects affecting, (45) 454; (46) 52; (49) 448.
- Kadota, origin and culture, (43) 239.
- liparid moth affecting, (46) 559.
- recipes, (43) 261.
- Smyrna, caprification, (43) Calif. 238.
- Smyrna, culture in America, (46) 444.
- Smyrna, nonsplitting variety, (43) 239.
- Smyrna, types, (43) 836.
- souring, cause, (43) 439.
- Splitting and souring, Calif. (47) 650; (48) 543.
- splitting, cause, (43) 439.
- "Stanford," proposed name, (43) 239.
- storage studies, (48) Calif. 535.
- storage temperature, (47) Calif. 640.
- studies in India, (46) 640.
- variety tests, (43) U.S.D.A. 339.
- wild, koleroga on, (44) 342; (48) 741.
- wild, parasites of, (44) 649.

Fiji disease, eradication, (49) 444.

Fiji disease galls, organism in, (49) 444.

Fiji lemon weevil, notes, (49) 56.

Fijole, notes, (48) Guam 228.

Filao tree diseases in Mauritius, (42) 354.

Filaria—

- bancrofti, transmission by Culex fatigans, (44) 656.
- gallinarum n.sp., description, (42) 180.
- gallinarum n.sp., notes, (41) 874.
- papillosa, notes, (41) 287.

Filariasis—

- in southern United States, (44) 656.
- notes, (48) 579.

Filberts—

- breeding experiments, (44) Oreg. 836.
- culture and diseases, (44) 44.
- culture and varieties, (47) 835.
- culture experiments, (50) Minn. 138.

Filberts—Continued.

- culture in England, (43) 746.
- culture in Northwest, (43) 746.
- culture, pruning, and harvesting, (48) Oreg. 238.
- nutritive value of proteins, (44) 461.
- pollination studies, (46) 340; (49) Oreg. 532.
- propagation studies, (44) Oreg. 836.
- vitamin content, water-soluble, (44) 461.

Filter paper—

- effect on permanganate-oxalate titrations, (46) 805.
- penetrability, (47) 506.

Filter press—

- cake, composition, (48) U.S.D.A. 725.
- cake, nitrification in acid red-clay soils, (48) 820.
- waste, fertilizing value, (42) 223; (49) 23.

Filters—

- membrane, apparatus for use with, (48) 502.
- membrane, for chemical analyses, (42) 411; (46) 614; (47) 712.
- sand, adsorption in, (46) 892.
- slow sand, action, (47) 91.

Filtration—

- industrial, treatise, (50) 612.
- symposium, papers, (46) 613.
- treatise, (49) 202.

Finches and canary hybrids, (48) 471.

Finger prints—

- hereditary factors for, (50) 731.
- statistical investigation, (49) 567.

Fir—

- budworm attacking, (43) 852.
- diseases in Switzerland, (42) 50.
- forests, snow breakage and top rot in, (45) 357.
- industry, handbook, (42) 349.
- insects affecting, (50) 153.
- root development, (48) 42.
- silver, yield tables, (43) 840.
- trees, spacing experiments, (46) 236.
- trees, thinning experiments, (41) 744.
- white, volume tables, preparation, (45) Calif. 838; (48) 541.
- wood, *Corticium evolvens* on, (45) 357.

Fire blight—

- bacteriological history, (46) 451.
- carriers, (41) N.Y.State 253.
- cause and prevention, (45) 356.
- dissemination, (47) Ohio 753.
- distributors, (46) 348.
- history in New Zealand, (45) 843.
- in orchards, control, (49) 149.
- notes, (42) 645, 740; (44) 445.
- of fruit trees, (47) 152.

Fire—

- cause of mutation in plants, (46) 27.
- insurance, farmers' mutual, system of records, (43) U.S.D.A. 193.
- insurance for standing timber, (43) 148.

Fire—Continued.

- insurance, mutual, U.S.D.A. (41) 194; (42) 689.
- prevention on farms, (42) 188, 789.
- Fireplaces, construction, (44) 689; (46) U.S.D.A. 386.
- Fires, forest, *see* Forest fires.
- Fires in cotton gins, source and prevention, (42) U.S.D.A. 284.
- Fireweed as honey plant, (41) Can. 556.
- Fireweed as silage crop, (41) Alaska 30.
- Firewood, *see* Wood, fuel.
- Fireworms, control, (50) Mass. 659.
- Fischer, E., biographical sketch, (41) 400; (47) 9.
- Fish—
 - anatomical variations as affected by water temperature, (48) 367.
 - as affected by buckeye, (47) Ala.Col. 785.
 - brine freezing, (46) 466.
 - canned, bacteriology, (48) 754.
 - canned, effect of lemon juice on, (42) Calif. 863.
 - canned, microorganisms in, (42) 164.
 - canning, (46) 664.
 - canning, cold-pack method outfits, (43) 808.
 - canning in England, methods, (46) 466.
 - cestodes from, (41) 455.
 - chial flesh, composition, (43) 563.
 - cold storage, cooking, (44) 61.
 - cold storage holdings, (49) U.S.D.A. 893.
 - conservation laws of Maryland, (49) 250.
 - control, (46) 460.
 - culture, fundamentals, treatise, (46) 720.
 - culture on the farm, (46) 73.
 - dried, fertilizing value, (43) 627.
 - drying, (41) 807.
 - drying, vacuum process, (42) 507.
 - dumplings, canned, description and analyses, (42) 552.
 - effect of milk waste, (50) N.Y.Cornell 488.
 - enemy of salt-marsh mosquitoes, (44) 656.
 - fluctuations of racial characters, (47) 864.
 - frozen, as poultry feed, (43) Minn. 674.
 - frozen, changes in composition, (43) 858.
 - frozen in chilled brine, keeping quality, (47) 560.
 - inheritance in, (48) 765.
 - inspection in Switzerland, (44) 148.
 - liver oils, sulphuric acid test for, (49) 611.
 - liver oils, vitamin A in, (46) 567; (47) 768.
 - manure industry, (47) 324.

Fish—Continued.

meal—

- analyses, (41) Can. 565, N.Y.State 868; (42) Mass. 866; (44) Mass. 671; (45) 872; (48) 68, Me. 68, Can. 368.
- as protein supplement for pigs, (49) Mich. 469.
- as stock feed, (43) 671.
- digestibility coefficients, (48) 574.
- dust, explosions from, (44) 421.
- energy value, (47) 69.
- feeding, effect on milk, (49) Fla. 875.
- feeding, effect on pork, (49) N.C. 775.
- feeding value, (42) Ala.Col. 870, Calif. 871; (46) 873; (47) 278, Wash.Col. 575; (48) 472; (49) N.C. 775; (50) 266, Can. 470, 870.
- plants, comparative efficiency, (49) 122.
- v. tankage, feeding value, (43) Mo. 772; (48) Wash.Col. 71.
- vitamin content, (50) Ohio 573.
- moth, notes, (43) Okla. 51.
- muscle, composition, (43) 569.
- nutrition of, vitamin A in, (48) 864.
- oil, drying tendencies, tests, (42) 591.
- oil, hydrogenated, use in tin plate manufacture, (42) 508.
- oil, substitute for castor oil, (44) 205.
- oils, changes in storage, (41) 310.
- oils, vitamin A in, origin, (47) 769.
- Pacific Coast, chemical study, (46) 466.
- ponds, construction and care, (41) Ohio 590.
- preservation by freezing, (49) 559.
- preservation in chilled brine, (46) 664.
- preservation in ice, (48) 755.
- preserved, chemical examination, (47) 611.
- preserving in the home, (43) 808.
- production in East Africa, (44) 594.
- pudding, canned, description and analyses, (42) 552.
- relation to mosquito control, (41) 553.
- salted, "pink" in, (50) 762.
- salting, factors affecting final product, (43) 663.
- sauce, Chinese, preparation, (44) 859.
- sauce, Indochinese, condensed, (43) 458.
- sausage, description and analyses, (42) 552.
- scrap, analyses, (41) Can. 565; (42) 263; (43) N.J. 672; (45) N.J. 775; (47) Mass. 274, 275, N.J. 571.
- scrap production in United States, (45) 730.
- sex differentiation in, (50) 331.
- sex-linked inheritance in, (48) 566.
- storage holdings, (41) U.S.D.A. 558.
- use in culture media, (43) 580.

Fish—Continued.

- usefulness in *Aedes* larvae control, (48) 751.
- vitamin requirements of, (49) 565.
- viviparous, inheritance in, (46) 268.
- waste fertilizers, analyses, (41) 428.
- zinc distribution in, (46) 566.
- Fisheries, importance of insects to, (45) 658.
- Fishery industries, treatise, (50) 709.
- Fishing, notes, (41) 743.
- Fistulous withers, relation to ticks, (41) 480.
- Flacourtia *gardnerii*, culture, (44) P.R. 235.
- Flag smut, control, (46) 448.
- Flag smut, in Victoria, (44) 152.
- Flammula *paxiana*, notes, (47) 547.
- Flap gates, hydraulic tests, (50) 587.
- Flat sours in canned foods, (50) Mich. 459.
- Flat-headed borers, notes, Oreg. (44) 850; (49) 555.
- Flavin—see also Proflavin.
 - antiseptic value, (41) 188, 474; (43) 79.
- Flavone pigment of *Eschscholtzia californica*, (43) 632.
- Flavoring—
 - extracts, analysis, (44) 9.
 - extracts, imitation, esters in, (47) 715.
 - materials, natural and synthetic, (49) 114.
- Flax—
 - analyses, (43) 829.
 - and kindred fibers, (49) 33; (50) 134.
 - and products, handbook, (44) 635.
 - and wheat as combination crops, (49) Minn. 431.
 - and wheat, relative cash value, (48) N.Dak. 226.
 - blooms, structure and fertilization, (43) 133.
 - bran, analyses, (48) Can. 368.
 - breeding experiments, (44) 435, 526; (45) 734; (46) 633.
 - browning and stem break disease, (49) 543.
 - canker, notes, (44) 844; (48) N.Dak. 44.
 - chaff, analyses, (42) 417.
 - Colletotrichum on, (41) 544, 655; (46) 239.
 - composition, effect of soil, (48) 720.
 - cost of production, (44) N.Dak. 190.
 - culture, (43) U.S.D.A. 435, 638, Ariz. 734; (44) 138, Alaska 329, 436; (45) 630.
 - culture—
 - and harvesting, (49) 132.
 - and preparation, treatise, (44) 528.
 - and processing, (50) 536.
 - and uses, (44) 528.
 - experiments, (41) Hawaii 138, 333, Can. 528, N.Dak. 824; (42) N.Dak. 732; (43) U.S.D.A. 134,

Flax—Continued.

culture—continued.

experiments—continued.

- Mont. 332, 528, Mont. 739, 824;
 (44) U.S.D.A. 36, Mont. 331,
 526, Calif. 731, Oreg. 826, 827;
 (45) N.Dak. 225, Wis. 228,
 Mont. 339, N.Dak. 734; (46)
 131, U.S.D.A. 724; (47) Alaska
 527; (48) N.Dak. 225, N.Dak.
 226, Can. 450; (49) Alaska 426;
 (50) Can. 231.
- for oil in England, (41) 734.
 in Alaska, (41) Alaska 31.
 in Argentina, (43) 436.
 in British East Africa, (41) 734.
 in British Empire, (43) 639.
 in Montana, (49) Mont. 432.
 on peat soil, (45) 735; (46) 216.
- curing and retting in France, (46)
 533.
- damage from various causes, (44)
 U.S.D.A. 118.
- determination of flexibility, (46) 230.
- disease, new, (49) 45.
- disease resistant varieties, (45) N.
 Dak. 225.
- diseases in England and Wales, (49)
 645.
- diseases, studies, (45) 649; (46) 743;
 (48) 46.
- experiments in Canada, (48) Can. 32.
- false, culture, (43) 638.
- fertilizer experiments, (43) 824; (44)
 421, 435.
- fiber and tow trading, (44) 829.
- fiber, breeding experiments, (48)
 U.S.D.A. 32.
- fiber content, estimating, (50) 335.
- fiber grading, (43) Can. 735.
- flea-beetle, life history and bionomics,
 (48) 459.
- flea-beetle, notes, (46) 743; (48) 152.
- frost resistance in, (49) U.S.D.A. 332.
- fungus attacking rootlets, (43) 244.
- Fusarium disease, notes, (47) 348.
- genetic analysis and multiple allelo-
 morphs, (50) 25.
- germination as affected by organic
 substances, (41) 523.
- grading, (46) 533.
- growth, early, in alkali soil, (42)
 Utah 28.
- growth in artificial light, (48) 26.
- gum fluid, insects inhabiting, (45) 551.
- harvesting in Argentina, (47) 32.
- heat canker, studies, (48) U.S.D.A.
 452.
- hybrids, studies, (50) 228.
- improvement in Sweden, (45) 738.
- in different retting stages, (50) 234.
- in textile industry, (49) 528.
- industry, effects of the war, (44) 635.
- industry in Australia, (42) 233.
- industry in Canada, (41) 532.
- industry in Ontario, outlook, (42) 230.

Flax—Continued.

- industry in Russia, (43) 488.
- industry in Victoria, (41) 532.
- insects affecting, (44) 57.
- insects affecting in Ireland, (48) 152.
- labor expense of production, (45) 85.
- male sterility in, (48) 28.
- New Zealand, culture in Great Britain,
 (41) 641.
- New Zealand, germination tests, (45)
 342.
- oil content, (45) 637.
- plant by-product, analyses, (45) 872.
- pollen and degeneracy, (50) 432.
- pollen, studies, (46) 32.
- production in Ireland, (46) 834.
- production in United States, statistical
 study, (49) U.S.D.A. 389.
- properties and uses, (50) 534.
- pulling machines, (45) Can. 822.
- relation to light, (44) 728.
- research activities, (50) 135.
- retting experiments, (48) 629.
- retting in Canada, (46) 230.
- retting, relation to stem anatomy,
 (50) U.S.D.A. 335.
- rotation experiments, (42) U.S.D.A.
 336; (43) N.Dak. 332, U.S.D.A. 435;
 (44) Minn. 330, N.Dak. 524; (45)
 Mont. 339; (47) Minn. 332.
- Russian, culture experiments, (43)
 Tex. 34.
- scutching trials, (45) Can. 822.
- seed and fiber yields, (47) Calif. 631.
- seed, nitrogen and oil content, (47)
 128.
- seed tests, (44) 143.
- seed treatment, (41) 655.
- seeding dates, (41) 230; (46) 531.
- seeding experiments, (43) U.S.D.A.
 330; (44) U.S.D.A. 37; (45) 735;
 (47) U.S.D.A. 330; (48) N.Dak. 30,
 U.S.D.A. 224, N.Dak. 225, Minn.
 331; (49) Can. 734.
- seeds, iron and manganese content,
 (49) 202.
- selection, (49) 228.
- stem disease, (47) 44.
- straw shives and bolls, analyses, (41)
 Can. 565.
- varieties, (49) 228.
- varieties for Canada, (47) 823.
- varieties for oil production, (44) 138.
- variety tests, (41) Idaho 226, 532,
 N.Dak. 824; (42) U.S.D.A. 337,
 N.Dak. 732, Minn. 824; (43)
 U.S.D.A. 134, Can. 735; (44) N.Dak.
 30, U.S.D.A. 36, Minn. 330, Mont.
 331, 435, 526, Oreg. 826; (45)
 N.Dak. 225, 340, 532, Can. 822, 827;
 (46) 436; (47) U.S.D.A. 330, Minn.
 332, U.S.D.A. 430; (48) N.Dak. 30,
 U.S.D.A. 224, Minn. 331, 629; (49)
 31, 232, Can. 734, U.S.D.A. 825;
 (50) U.S.D.A. 132.
- water requirements, (50) 828.

Flax—Continued.

- wilt and canker resistance, (41) N.Dak. 140.
- wilt, control, (45) 50.
- wilt disease, (47) 839.
- wilt organism, metabolism, (50) Minn. 146.
- wilt resistance, (44) Minn. 745; (47) Minn. 331, Minn. 347; (48) N.Dak. 44; (50) Minn. 144.
- wilt resistant varieties, (44) U.S.D.A. 37; (50) Minn. 143.
- wilt resistant variety, (48) N.Dak. 30.
- winter, culture, (50) 639.
- yellow-leaf disease, (45) 433.
- yields, (44) N.Dak. 31; (46) Mont. 327; (47) Wash.Col. 528.

Flaxseed—

- analyses, (48) 68, Can. 368.
- and chaff, analyses, (41) Can. 565.
- cake, analyses, (41) N.Y.State 868.
- feed, analyses, (47) Ind. 473.
- oil extraction from, (44) 436.
- oil, production, (46) 636.
- production, trade, and foreign competition in, (49) 794.
- quality, factors affecting, (50) 436.
- screenings, ground, analyses, (43) Ind. 69.

State standards, (44) Mont. 143.

Flea leptomnad, studies, (41) 781.

Flea-beetle, horse-radish, control, (44) N.J. 350.

Flea-beetles—

- annotated list, (45) Md. 858.
- habits and control in Denmark, (45) 858.
- of Philippines, life history and habits, (48) 359.
- studies, (43) Mont. 758; (45) 558.

Fleahopper in alfalfa, studies, (45) U.S.D.A. 858.

Fleas—

- dog, remedies, (41) 662; (44) U.S.D.A. 161.
- of Panama, (50) 55.
- on dogs and cats, control, (47) 53.
- on wild animals in Montana, (50) 359.
- parasites of, (45) 558.

Fleischmann, W., biographical sketch, (45) 576.

Flies—

- bacterium pathogenic for, (50) 455.
- biting, and surra, (47) 358.
- biting, relation to swamp fever, (41) Wyo. 478.
- bloodsucking, attacking camels, (42) 78.
- bloodsucking, in Porto Rico, (47) 853.
- bloodsucking, value of cow for collecting, (48) 254.
- carriage of intestinal protozoa of man, (45) 556.
- cestode parasites of, (45) 556.
- control, (41) 661; (49) 356.
- development and longevity, relation to microorganisms, (50) 560.

Flies—Continued.

- dispersion by flight, (45) 760.
- effect of food on longevity and reproduction, (50) 456.
- Empusa disease, (42) 361.
- feeding on Mollusks, life history, (42) 454.
- flight distances, (41) 259.
- habits, (42) 361, 453.
- house, *see* House fly.
- in house and hospital, (42) 152.
- muscoid, *Herpetomonas muscae-domesticae* in, (50) 560.
- muscoid, new genera and species, (42) 157.
- muscoid, new species, (48) 855.
- muscoid, synopsis of puparia, (46) 661.
- overwintering, (48) 157.
- parasites of, (42) 361.
- parasitic, of India, (48) 855.
- Pipunculus, parasitism by, (43) 661.
- Platypezid, protective movements and range of vision, (47) 358.
- poisoning by formaldehyde, (45) 257.
- pupae, occurrence in bottled milk, (42) 173.
- relation to anthrax, (41) La. 461.
- sand, *see* Sand flies.
- suppressing material, (47) 551.
- transmitters of *Habronema*, (50) 455.
- two-winged, revision, (50) 848.
- white, *see* White fly.

Floats, *see* Phosphate rock.

Flood—

- control, (42) 682; (43) 788.
- control in agriculture, (46) 98.
- control, plans and works in California, (42) 479.
- crest stages, rules for forecasting, (44) U.S.D.A. 716.
- crests on Ohio and Mississippi, (44) U.S.D.A. 716.
- in Arkansas River, (47) 388.
- protection districts, benefit assessments in, (48) 681.
- protection works, plans and contracts in Ohio, (42) 479.

Floods—

- cause and effects, (42) 572.
- in central Texas, (49) 383.
- in Colorado, (49) 383.
- maximum, distribution, U.S.D.A. (42) 618, 620; (43) 511.
- of Colorado River, control, (47) 187.
- spring, of 1922 in Mississippi Basin, (48) U.S.D.A. 715.

Floor deflections, measuring, (47) 793.

Floors and floor covering, (46) U.S.D.A. 89.

Floors for farm buildings, (47) 91.

Flora—*see also* Vegetation, Plants, *etc.*

- of British Guiana, (46) 222.
- of District of Columbia and vicinity, (42) 223.
- of Florida Everglades, (42) 724.
- of Hawaiian Islands, (42) 724.
- of India, (41) 522.

Flora—Continued.

- of islands near New Zealand, (43) 31, 129; (45) 222.
- of Jamaica, (46) 222.
- of Mexico, (41) 821.
- of Michigan, notes, (41) 820, 821.
- of Mount Rainier National Park, (48) 447.
- of Oregon coast, (46) 222.
- of southeast Africa, origin, (48) 730.
- of Stewart Island, New Zealand, taxonomic distribution, (42) 724.
- of Swedish phanerogams, (45) 338.
- of Virgin Islands, (41) 219.
- of woods of Hertfordshire, (43) 241.

Floral asymmetry, cause and significance, (47) 221.

Floras—

- dwarf shore, (41) 820.
- insular, endemism, (41) 220.

Floriculture, commercial, treatise, (48) 639.

Floriculture in United States, (45) 644.

Florida—

- red scale, control, (48) 852.
- Station, notes, (41) 300, 798; (42) 300, 695, 797; (43) 599, 799, 899; (44) 298; (45) 199, 600, 900; (46) 298; (48) 499; (49) 396, 600, 899; (50) 96.
- Station, report, (41) 598; (48) 298; (49) 898.
- University, notes, (41) 798; (42) 300; (43) 599, 899; (44) 298; (45) 199, 600; (46) 298; (48) 499; (49) 299, 396, 600; (50) 96.

Florideae, mucilaginous substance of, (44) 202.

Floridose, use of term, (44) 202.

Flosses, properties and uses, (50) 534.

Flounders, zinc in muscle tissue, (47) 564.

Flour—*see also* Buckwheat, Rice, Wheat, *etc.*

- action of hydrogen peroxid on, (44) 612.
- adulteration, detection, (42) 415; (47) 806.
- analyses, (42) 861; (45) 506; (47) 275; (50) Conn.State 160.
- analysis, graphical representation, (43) 615.
- and bread making, (49) 660.
- and wheat, correlation between characters, (48) Me. 440; (49) 231.
- baking qualities, (43) Wash. 764.
- baking strength, (46) Can. 162.
- baking tests, (42) 93; (43) Me. 641, Ariz. 734; (44) U.S.D.A. 141; (49) 135.
- baking tests, relation to wheat grading, (45) 61.
- beetle, confused, notes, (41) 57, 358, 759; (44) Minn. 753; (48) 652; (50) 51.
- bleaching, papers on, (44) 168.
- bread making properties, factors affecting, (45) 364.

Flour—Continued.

- buffer action of water extracts, (46) 612.
- catalase, studies, (47) 505.
- determination of percentage extraction, (41) 313.
- determining quality and market value, (43) 615.
- diastatic enzymes, relation to strength, (48) 504.
- durum, baking tests, (46) 536.
- enzymes in, effect on bread, (44) 761.
- equivalent tables for wheat, (48) 233.
- extraction and admixture as affecting yeast activity, (41) 362.
- fat determination in, (45) 13.
- Federal price control, (42) N.Dak. 492.
- foreign starches in, detection, (46) 807.
- from Alaska wheat, value for pastry, (47) 764.
- from Indiana wheat, (49) Ind. 257.
- from lupines, analyses, (43) 458.
- from various products, characteristics and detection, (41) 467.
- fumigated, hydrocyanic acid absorption and retention by, (49) 456.
- fumigation methods, (42) 152.
- germ in, effect on nutritive value, (41) 467.
- gluten content, determination, (41) 803.
- grade, effect on H-ion concentration of dough, (50) 10.
- grades, electrical conductivity and ash, (45) 615.
- grades, studies, (46) 612; (48) 806.
- grading, (41) 799.
- Graham, analyses, (42) Tex. 769.
- Graham, digestibility as affected by milling, (42) 254.
- heat of hydration and specific heat, (44) 61.
- hemicellulose of, (50) 310.
- hygroscopic moisture, (44) 612.
- Indian, vitamin B in, (47) 661.
- insects affecting, (41) 162, 456, 463; (42) 152, 153, 551.
- inspection and analysis, (45) Conn. State 365.
- interim report, (50) 690.
- Kafir corn, (41) Kans. 64.
- manufacture, processes, (45) 663.
- microscopical examination, significance of wheat hairs in, (48) U.S.D.A. 503.
- milling, (41) 261.
- milling—
 - and baking data, N.Dak. (48) 29, 233.
 - and bread baking qualities, (46) Ohio 665.
 - and moisture content, (41) U.S. D.A. 169.
 - chemical manual for, (49) 114.
 - effect of weather, (46) 860.

Flour—Continued.

- milling—continued.
 - laboratory control of, (44) 311.
 - microscopical studies, (47) 108.
 - rôle of cereal chemist in, (45) 210.
 - tests, (49) 831.
 - theory and practice, (44) 168.
 - trade, tables for, (48) 233.
 - yield formula, (42) 861.
- mills, fire prevention, handbook, (47) 689.
- mills, insect control in, (44) U.S.D.A. 251; (45) 454; (47) Ohio 358.
- mills of Minnesota, (42) 392.
- mills, State ownership, (45) 595.
- mills, Swiss cooperative, (49) 94.
- moisture content, (46) 561, U.S.D.A. 665.
- moth, effect of gaseous reagents on, (42) 153.
- moth, Mediterranean, life history, (42) 854; (43) 51; (47) 853.
- moth, Mediterranean, paper on, (42) 153.
- moth, Mediterranean, parasite of, (45) 655.
- of Russian wheat, milling and baking tests, (50) 338.
- offal content determination, (43) 313.
- phytin content, (47) 366.
- potato, manufacture, (47) 808.
- prepared, vitamins in, (46) 469.
- price variations, relation to wheat price, (50) 691.
- production in Brazil, (43) 292.
- protecting from insect attack, (50) Minn. 152.
- protein removal from, technique, (49) 110.
- red dog, analyses, (41) N.H. 68, Can. 564, R.I. 564, Ind. 868, N.Y.State 868; (42) Mich. 63, 263, 560, Ind. 769, N.H. 769, Mass. 866; (43) Ind. 69, Ky. 373, Vt. 464, N.J. 672, 867, Ind. 867; (44) 267, N.H. 671; (45) Tex. 68, N.Y.State 469, N.J. 775, 872, Vt. 872; (46) Can. 167, N.H. 675, Tex. 675; (47) Mass. 274, Conn.State 570, N.J. 571; (48) 68, Me. 68.
- red dog and shorts, analyses, (44) Mass. 671.
- red dog, composition and retail price, (47) Conn.State 570.
- rye, milling grade, (41) 313.
- self-rising, carbon dioxid in, (47) 715.
- self-rising, examination, (47) 560.
- statistics during the war, (44) 694.
- stored, acarids of, (44) 851.
- strength, carbon dioxid of dough as index, (47) 261.
- strength, chemistry of, (49) 308.
- strength, effect of addition of diastatic ferments, (49) 12.
- strength, effect of starch, (50) 712.

Flour—Continued.

- strength, factors affecting, (44) 60, N.Dak. 357.
 - strength of New Zealand wheat, (50) 438.
 - strong and weak, physicochemical studies, (50) 502, 503, 504.
 - substitutes in bread making, (43) 64.
 - substitutes in Germany, (43) 204.
 - substitutes, protecting from insects, (44) Minn. 753.
 - substitutes, use for food, (47) 612.
 - testing mill, State, in Minnesota, (46) 499.
 - trade between United States and Canada, (44) U.S.D.A. 491.
 - trade of United States, (49) 795.
 - wheat middlings, analyses, (48) 68.
- Flower—
- beetle, Japanese, in New Jersey, (41) 666.
 - color genetics of, (43) 328.
 - color, optimum altitude for, (50) 427.
 - color, studies and theories, (42) 333.
 - form and color in phlox, (44) 428.
 - gardening, treatise, (42) 43.
 - gardens and grounds, English, (45) 744.
 - thrips injuring peaches, (41) Mich. 660.
 - thrips, notes, (47) Fla. 655; (49) Ind. 548.
- Flowering plants, *see* Plants, ornamental.
- Flowers—
- acclimatization, (50) Alaska 539.
 - annual and perennial, (49) West.Wash. 97.
 - blending colors in, (43) 240.
 - color and sex in, (45) 629.
 - culture, (43) Nebr. 644.
 - culture in California, (49) 438.
 - culture, indoor and outdoor, (48) 736.
 - culture, treatise, (42) 43; (46) 138.
 - cut, freezing temperatures, (48) U.S.D.A. 730.
 - cut, industry, manual, (43) 838.
 - effect of pollination on life of, (44) 44.
 - for Alaska, (44) Alaska 336.
 - for cutting and decoration, treatise, (50) 39.
 - hardy border, handbook, (45) 838.
 - monthly working calendar for, (43) 236.
 - morphological studies, (44) 628.
 - nectaries in, (45) 123.
 - of Yellowstone National Park, (50) 645.
 - perennial, for North Dakota, (50) N.Dak. 837.
 - variety tests, (50) Can. 643.
 - wild, culture, (50) 240.
 - wild, of California, studies, (44) 640.
 - wild, of Nantucket, (45) 239.
 - wild, of New York, (45) 45.
 - withering processes, (47) 328.

Flue dust, potash content, (43) 28.

Fluid, measuring small volumes, (41) 203.

Fluke—

African, structure and life history, (45) 584.

disease, control, (44) 581.

infections and destruction of intermediate host, (47) 460.

Flumes—

irrigation, replacing wood with metal, (42) 780.

metal, design and life, (47) 388, 389.

short-box measuring, studies, (48) U.S.D.A. 87.

Venturi, anomalous results in, (48) 286.

Venturi, as measuring device in open channels, (43) 887.

Venturi, increased application for, (48) 586.

wooden, roofing paper lining for, (42) 576.

Fluorescein, use in tracing underground water, (45) 789.

Fluorid, effect on rats, (45) 281.

Fluorin—

compounds as fungicides, (47) 45.

compounds, toxic action on plants, (49) 127.

effect on plants, (43) 523.

fertilizing value, (41) 428, 820.

in food materials, (45) 665.

in soils, plants, and animals, (41) 126.

Fluorspar, effect on phosphatic slag, (46) 22.

Flying fields, selection of, (44) U.S.D.A. 416.

Foals, purebred draft, feeding experiments, (49) Wis. 672.

Foam test for detection of butter substitutes, (42) 162.

Fodder crops, *see* Forage crops.

Fodders, succulent, and vitamins, (50) 774.

Fog phenomenon of San Francisco Bay, (43) U.S.D.A. 719.

Fomes—

annosus, notes, (42) U.S.D.A. 248; (44) 347.

annosus, soil conditions affecting prevalence, (49) 447.

applanatus, biology of, (45) 452.

fomentarius, notes, (48) 249.

igniarius, enzym action in, (48) 353.

igniarius, notes, (44) Conn.State 149, 355; (45) 549.

juniperinus, notes, (47) 348.

lignosus, host plants, (46) 455.

lignosus on rubber, (47) 549.

lignosus, toxicity of lime to, (49) 518.

lucidus, notes, (41) 522, 658; (45) 48.

lucidus on oil palms, (43) 652.

officinalis, cause of roof decay, (42) 249.

officinalis chlamydo spores in nature, (48) 747.

officinalis, summary, (46) 348.

pinicola, notes, (45) 548; (48) 147.

Fomes—Continued.

pseudoferreus n.sp., notes, (42) 646.

pseudoferreus, new name for *Poria hypolateritia*, (43) 45.

pseudoferreus, notes, (48) 45, 851.

rimosus, notes, (41) 453.

root disease, (49) 45.

root rot on currants, (42) N.Y.State 350.

roseus, studies, (47) U.S.D.A. 451.

spp., notes, (42) 646, 647; (45) 843; (47) 547, 548; (48) Can. 51; (49) 45.

spp. on blazed trees, (46) 151.

spp. on Douglas fir, (49) U.S.D.A. 755.

spp. on rubber, (45) 148.

ulmarius, closing London drain pipe, (45) 357.

Fontaria spp., migration of, (42) 755.

Food—*see also* Diet.

acid and base content, effect on urine composition, (49) 764.

adulteration, history and control, (42) 863.

allergy, cause of illness, (50) 262.

analyses and energy values, treatise, (46) 161.

analysis, (41) N.Dak. 763; (43) 14, Me. 662, Conn.State 859; (47) 805; (50) 266.

analysis, laboratory manual, (41) 412, 710; (47) 715.

analysis, methods, (44) 9; (45) 109; (47) 505.

analysis, treatise, (49) 407.

and drug manual, (43) U.S.D.A. 164.

and Drugs Act, Federal, effects of enforcement, (43) 662.

and nutrition, monograph, (42) 56.

and nutrition projects at experiment stations, (46) 602.

and nutrition, relation to climatic conditions, (46) 561.

and public health, (42) 253.

and public health in South Africa, (42) 458.

animals in United States, (48) U.S.D.A. 68.

assimilation, effect of vitamins, (49) 159.

at Lincoln State School and Colony, (50) 360.

bottled, volume variations, (46) U.S.D.A. 468.

budget, minimum quantity, (44) 169.

calendar, description, (42) 364.

campaign in England, 1916-1913, (47) 363.

center, part of the board of health, (45) 61.

chemistry, (43) 563.

chemistry—

and human nutrition, (46) 355.

and preparation, textbook, (50) 898.

micro and half micro methods in, (49) 112.

Food—Continued.

- chemistry—continued.
 - micro methods in, (47) 805.
 - progress in, (42) 253; (48) 802.
 - review of literature, (42) 659; (43) 365; (48) 411.
 - treatise, (43) 609; (46) 560; (49) 559.
- Chemists, German Society of, (49) 608.
- chlorin determination in, (48) 807.
- cleanliness in handling, (47) 764.
- clinics, organization, (47) 764.
- conservation, (47) 164.
- conservation and regulation, (41) 92.
- conservation movement, value, (46) 562.
- consumption—
 - by recruits and seasoned troops, (41) 854.
 - in Kansas institutions, (46) 468.
 - in the training camps, (41) 854.
 - in United States, (43) 61.
 - of underweight women, (48) 160.
- control—
 - during 46 centuries, (49) 559.
 - Federal, progress in, (47) 164.
 - from standpoint of nutrition, (42) 253.
 - in Canada, (41) 295.
 - in England and Germany during the war, (43) 459.
 - in Germany, (44) 859.
 - in Great Britain, (41) 67.
 - in hotels and restaurants, (47) 764.
 - in Italy, (41) 67.
- crisis, treatise, (41) 92.
- crops, yields in Ireland, (46) 391.
- dietary properties, (49) Ark. 364.
- distribution, reforms in, (46) 694.
- energy value, determination, (46) 755.
- energy values, comparison, (47) 460, 461.
- exports, United States to England, (41) 66.
- factors in gastroenterology, (42) 465.
- for farm families, (45) U.S.D.A. 763.
- for hotel employees, supervising, (43) 663.
- for the family, (42) 458; (44) 664; (46) U.S.D.A. 498, U.S.D.A. 666; (49) 56, U.S.D.A. 158.
- habits, changes in, (47) 363.
- habits of insects, (48) 851.
- handlers, examination for, (47) 263; (48) 160; (49) 559.
- in industrial plants, (43) 564, 663.
- in the home, care, (50) U.S.D.A. 360.
- Indian, vitamin content, (47) 661.
- industries of France, treatise, (43) 260.
- industries, textbook, (44) 660.
- industry, chemical problems, (45) 108.
- infections, symptoms and cause, (46) 571.

Food—Continued.

- ingestion, effect on purin metabolism, (46) 757.
- inspection, (41) Conn.State 170, Me. 171, N.Dak. 669; (50) Me. 58.
- inspection and analysis, (43) 313; (45) Conn.State 365.
- inspection in Great Britain (41) 66.
- inspection in Maine, (41) 66.
- inspection, treatise, (44) 475.
- Investigation Board of Great Britain, report, (48) 753.
- iodin in, (48) 861.
- judging, discussion, (42) 456.
- law protection, cost to consumer, (44) 168.
- lessons for nutrition classes, (48) 896.
- manufacture, (50) 97.
- manufacture, chemical control, (43) 409.
- manufacture, relation to nutrition, (46) 256.
- materials, egg content determination, (45) 13.
- materials, one cupful of, weights, (48) 159.
- materials, oxidation to avoid loss of metals, (50) 613.
- materials, strictly exogenous, (46) 259.
- needs of man and animals, (48) 857.
- pastes, analyses, (42) 162.
- pastes, eggs in, determination, (47) 611.
- plants, American, (42) 432.
- plants, important, (41) 729.
- plants, wild, of Philippines, (45) 821; (48) 842.
- poisoning—
 - and prevention, (48) 659.
 - bacterial, from mutton, (48) 468.
 - botulinus, (42) 558.
 - by milk, (48) 867.
 - cause of gastroenteritis, (42) 663.
 - causes, classification, (48) 659.
 - discussion, (43) 458.
 - due to proteus group, (41) 84.
 - identification of bacteria in, method, (43) 113.
 - investigations, (48) 365.
 - organisms, effects of dehydration, (43) 317.
 - outbreak due to egg salad, (50) 64.
 - outbreak in Brixton, (44) 264.
 - treatise, (43) 261.
 - with *Bacillus suipestifer*, (47) 170.
- preparation—
 - and service in University of Chicago dining rooms, (48) 258.
 - in Chicago State Hospital, (50) 360.
 - in prehistoric times, (46) 467.
 - in quantity, (42) 863.
 - laboratory guide, (48) 193.

Food—Continued.

- preservation, (44) 461, 663; (47) 263.
- preservation—
 - and botulism, treatise, (50) 167.
 - by freezing, (49) 559.
 - course in, (49) 297.
 - manual, (42) 804.
 - relation to *Bacillus botulinus*, (45) 167.
 - studies at experiment stations, (46) 608.
 - theory and technique, instruction in, (48) 857.
- preservatives, analysis, (44) 9.
- prices, government control, (43) 394.
- prices in 1914 and 1920, (42) 755.
- production—
 - and manufacture, (44) 660.
 - in Denmark, before and after the war, (43) 292.
 - in England, treatise, (49) 389.
 - in United Kingdom, (41) 490, 591.
 - in war, treatise, (49) 290.
- products—
 - examination, (41) 888.
 - impurities in, identification, (50) 805.
 - insects affecting, (49) 252.
 - inspection, (47) Conn.State 559.
 - inspection law, regulations, U.S. D.A. (42) 190; (43) 794; (46) 291; (48) 189.
 - retailing, self-service in, (47) U.S.D.A. 193.
 - source, chemistry, and use, treatise, (46) 859.
 - standards of purity, (41) U.S.D.A. 313.
 - storage holdings, U.S.D.A. (41) 66, 558.
 - stored, insects in, (47) Minn. 453.
- provision by Government for women employees, (42) 863.
- putrid, toxicity, (46) 753.
- rationing in Denmark, effect on health, (44) 260.
- recipes, foreign, tested, (42) 364.
- regulations in Italy, (43) 65.
- requirements of children, (45) 162; (47) 766; (49) 762.
- requirements of man, (42) 658.
- requirements of man, variations, (41) 362.
- requirements of women workers, (41) 761, 856.
- Research Institute, establishment, (44) 399.
- Research Institute of Stanford University, (46) 798.
- Research Institute, organization and policies, (49) 660.
- Research Laboratory in Japan, (49) 499.
- resources of United States, (43) 60.
- restriction during war, effect on mortality, (42) 459.
- saving and sharing, treatise, (41) 897.

Food—Continued.

- selection—
 - and preparation, (44) 660.
 - course in, (45) 62.
 - economics of, (50) 262.
 - in child welfare work, (48) 61.
 - situation—
 - in Austria, (41) 67.
 - in France during the war, (42) 456.
 - in Germany, (42) 592, 657, 687.
 - in Japan, (42) 864.
 - standard railway sanitary code, (44) 260.
 - substitutes, (46) 755.
 - substitutes—
 - and control in Germany, (46) 666.
 - in Germany, treatise, (43) 204.
 - papers on, (41) 66.
 - preparation, (44) 460.
 - supply—
 - assurance of through contracts, (42) 189.
 - cooperation in, (42) 552.
 - crisis in Switzerland, (44) 388.
 - economic position of United Kingdom, (42) 189.
 - for increasing population, (47) 296.
 - in Soviet Russia, (48) 691.
 - in wartime, (42) 551.
 - of a nation, conservation principles, (42) 755.
 - of Austria, (50) 895.
 - of our allies, (41) 67.
 - of United Kingdom, (43) 694; (44) 192.
 - of United States, (46) 590.
 - world, agronomist's part in, (44) 632.
 - world, relation to consumption, (45) 191.
 - world, studies, (42) 790.
 - surplus in United States, social aspects, (48) 690.
 - surveys, U.S.D.A. (41) 66, 362.
 - tests, biological, (50) 59, 462, 857.
 - unpalatable, utilization by body, (44) 664.
 - use and preparation, (42) 298, 364, 755.
 - value of milk, paper on, (49) 176.
 - values, U.S.D.A. (46) 465; (50) 762.
 - values, calculation, (41) 66; (44) 559.
 - values, modern science of, (43) 62.
 - values, teaching in elementary schools, (43) 97.
 - waste in hospitals, (42) 458.
- Foods—
- and condiments, chemistry of, (45) 862.
 - and cookery, textbook, (45) 399.
 - and furnishings for dining cars, (48) 61.
 - and markets department, State, use to fruit growers, (42) 289.

Foods—Continued.

- animal, production and consumption in British Empire, (43) 593.
- animal, world's supply, (43) 593.
- antirachitic effect, testing, (48) 564.
- ash of, significance of alkalinity, (48) 205.
- bacteriology and mycology, treatise, (41) 360.
- canned, *see* Canned foods.
- cereal, treatise, (42) 456.
- coloring matter in, (47) 312.
- cooked in pressure cooker, effect, (46) 257.
- copper content, (42) 758.
- courses of study, (43) 797.
- cyanid gas adsorption by, (45) 62.
- determination of acidity, (43) 11.
- diabetic, analyses, (43) Conn.State 861.
- diabetic and special, analyses, (50) Conn.State 160.
- dried, standards for, (43) 368.
- examination under pure food law, (46) Me. 60.
- extra, energy content, (42) 659; (45) 861.
- factors in estimation of nutritive value, (41) 264, 361.
- famine, in India, (45) 61.
- fat determination in, (48) 805; (50) 614.
- fried, changes in fats absorbed by, (44) 662.
- gastric response to, (42) 861.
- green, vitamin A extraction from, (43) 165.
- H-ion concentration, (41) 763.
- increasing in wartime, (47) 612.
- infant, analyses, (42) 162.
- lowered nutritive value of, in Germany, (42) 253.
- metals from cooking utensils in, (50) 763.
- microbiology and microanalysis, treatise, (45) 462.
- microscopic examination, manual, (49) 12.
- molds in, detection, (47) 314.
- nitrogen determination, modified method, (43) 316.
- of France and colonies, (50) 561.
- package, weight variation, (44) U.S. D.A. 204.
- perishable, design of railroad cars in England for, (42) 589.
- perishable, handling, (49) R.I. 91.
- phytin content, (47) 366.
- planning and preparation, textbook, (50) 298.
- plant adulterants, detection, (42) 415.
- preserved, nutritive value, (45) 463.
- purified, experiments, (48) 558.
- sanitary survey, (43) N.Dak. 368.
- slimy decomposition, studies, (44) 75.
- South African, antiscorbutic value, (47) 568; (50) 64.

Foods—Continued.

- stored, bacteriological character, (43) 317.
 - sulphites in, tests, (48) 12.
 - supplementary protein values, (48) 262.
 - teaching in rural schools, (46) 792.
 - treatise, (41) 558; (42) 658.
 - tryptophan content, (46) 758.
 - vegetable and fish, in Madeira, (46) 859.
 - vitamin C in, protection, (49) 563.
 - vitamin values, table, (50) U.S.D.A. 762.
 - vitamins in, (44) 667; (46) Ark. 667, 864.
 - vitamins in, stability, (50) Minn. 163.
 - vitamins in, tests, (48) 12.
 - with specific action, (46) 470; (47) 767, 859; (48) 556; (49) 358, 766.
 - zinc in, (42) 710, 758.
- Foot-and-mouth disease—
- and blood transfusion, (48) 481.
 - and cowpox, reciprocal immunity, (48) 879.
 - artificial transmission, (45) 76.
 - British investigations, (44) 799.
 - cause, (47) 585.
 - chemotherapy and prophylaxis, (45) 180.
 - composition of milk during, (47) 282.
 - contagious period in, (47) 881.
 - control, (45) 383, 384; (49) 179.
 - control in Switzerland, (45) 181.
 - danger of aphthisation, (45) 481.
 - epizootic, (45) 786.
 - epizootic, in Italy, (47) 81.
 - eradication, (43) U.S.D.A. 471.
 - eradication in Germany, (47) 585.
 - experimental studies, (48) 178.
 - immune serum, (48) 776.
 - immunity from milk of cured animals, (46) 376.
 - immunization, (41) 378; (43) 383; (44) 183, 477, 478, 579, 779, 878; (46) 375; (47) 81, 384; (49) 282; (50) 683, 684.
 - immunization, abscesses from, (50) 881.
 - in Great Britain, (46) 178; (48) 775; (50) 182, 882.
 - in Italy, (41) 284.
 - in Jamaica, (48) 481.
 - infection and immunity, (48) 775.
 - invasion into Great Britain, (45) 177, 281.
 - notes, (41) 873; (44) 180; (46) 277, 773; (50) 582.
 - outbreaks, need of preparedness, (44) 376.
 - oxygen chemotherapy, (45) 785.
 - plurality, (50) 881.
 - possible duality, (47) 81.
 - prevention and treatment, (41) 576; (44) 376, 877.
 - relation to bird migrations, (50) 380, 786.

Foot-and-mouth disease—Continued.

- review of literature, (47) 787.
- sequel, (44) 376.
- sera, standardization, (46) 774.
- serum production in, (46) 881.
- significance of complement fixation test in, (49) 882.
- studies, (45) 580, 581, 683; (46) 579.
- summary, (50) 380, 683.
- susceptibility of small animals, (45) 882.
- treatment, (46) 881.
- virulence of blood in, (47) 384.
- virus, adsorption, (45) 383.
- virus, plurality, (47) 680.
- work, progress in, (48) 676.

Foot rot, contagious, notes, (48) 579.

Forage and grain, amount for work animals, (46) Ill. 678.

Forage crops—

- breeding experiments, (44) 526, 632, Oreg. 826.
- breeding methods, (44) 827.
- chemical study, (50) Oreg. 7.
- climatic requirements, (41) U.S.D.A. 417.

cultivation and use in Brazil, (43) 68.

culture, (45) 630; (46) 30.

culture—

- directions, (47) Miss. 428.
- experiments, (41) Nebr. 638; (43) Mont. 332; (44) N.Dak. 88, 433, 526, 632, 733, Oreg. 826; (45) 340, 532, P.R. 631, 734; (46) 131, 227, 634; (48) 629; (49) Mont. 430.
- experiments in South Australia, (41) 639.
- experiments in Wyoming, (41) 528.
- in Cyprus, (44) 137.
- in Nigeria, (43) 637.
- diseases, (42) 541; (43) 652; (46) Kans. 448; (49) N.Dak. 343.
- diseases in England and Wales, (49) 645.
- feeding value, (50) Ill. 673.
- fertilizer experiments, (44) 733, Oreg. 826; (45) 532; (46) 227, 634.
- for Australia, (47) 227.
- for Cotton Belt, (43) U.S.D.A. 638.
- for Cotton Belt, suggestions to teachers, (44) U.S.D.A. 698.
- for fattening lambs, (44) Ohio 365.
- for fattening pigs, (44) Ohio 471.
- for nonirrigated lands, (43) Idaho 738.
- for pigs, (45) Ohio 271; (48) 767; (49) Mont. 170.
- for weanling pigs, (42) Mont. 67.
- in Burma, (41) 529.
- in Denmark, (43) 177.
- in India, (41) 529.
- in Mexico, (41) 821.
- in South Africa, (41) 528.
- in Virginia, (42) Va. 436.

Forage crops—Continued.

- in Wales, (46) 727; (47) 226.
- in western India, (47) 32.
- in western Kansas, (45) Kans. 32.
- increase in Denmark, treatise, (46) 227.
- insects affecting, (43) 652; (44) 653.
- irrigation experiments, (46) 634.
- leguminous, of Brazil, (49) 34.
- notes, (43) 527.
- production in Cuba, (42) 31.
- rotation experiments, (44) Oreg. 826, 827; (45) 532.
- seed tests, (44) 143.
- seeding experiments, (50) Can. 533.
- soil heating and manuring experiments, (41) Hawaii 138.
- table for, (48) 872.
- tests, (48) 629; (49) 825.
- under dry farming, (49) Mont. 430.
- value in lower feed costs, (49) Iowa 373.
- varieties for seed in Poland, (50) 439.
- variety tests, (41) Tex. 36, Idaho 225, Nev. 227, Mo. 637; (43) Nev. 229, La. 636, Can. 735; (44) Mont. 331, 433, 526, 632, 733, Oreg. 826, 827; (45) Idaho 223, 532, 735, Can. 822; (46) 131, 227, 634; (47) Nebr. 736; (48) 31.

Forage—

- feeding methods, (49) Mont. 170.
- grasses, comparisons, (48) 434.
- grasses, manual, (44) 827.
- grasses, variety tests, (48) 31.
- green, electrical method of preserving, (48) Calif. 568.
- materials in the Sudan, analyses, (45) 774.
- nonleguminous, digestibility, (47) Tex. 472.
- plants—
 - analyses, (41) Wyo. 333.
 - and grasses, (47) Calif. 630.
 - during drought in India, (48) 371.
 - from New South Wales, (48) 435.
 - important, (41) 729.
 - in Brazil, (44) 526.
 - in France, treatise. (42) 437.
 - in India, (44) 527.
 - seed-borne diseases, (44) Ala.Col. 744.
- poisoning—*see also* Cattle, Livestock, Range poisoning, and Plants, poisonous.
 - by ergot, (42) 474.
 - by whorled milkweed, (43) Colo. 141.
 - investigations, (43) Ind. 385.
 - notes, (41) 784; (45) Mich. 280.
 - relation to botulism, (41) 170, 280, 681.
 - summary, (43) 580.
 - substitutes, feeding value, (42) 769.
- Forage betae n.comb., identity, (41) 255.

Forest—

- academy v. agricultural high school, (44) 93.
- administration, *see* Forestry.
- aerial photographs, (43) 748.
- areas, burned over, erosion and vegetation, (44) 537.
- areas, cut-over redwood, agriculture in, (49) Calif. 90.
- areas, effect on evaporation and soil moisture, (44) U.S.D.A. 716.
- areas, national, acquired under Weeks Act, (44) U.S.D.A. 340.
- bog, in Birtish Columbia, (47) 836.
- botany, treatise, (46) 221.
- clearing machinery in Germany, (42) 278.
- College, Imperial, report, (46) 791.
- communal, for Ithaca, (45) N.Y.Cornell 644.
- communities, need for organization of, (42) 44.
- communities, regulations, (43) 441.
- composition in the far North, (41) 634.
- conservation, (42) 738; (43) 343.
- control in Portugal, (43) 442.
- cover, effect on stream flow, (46) 738.
- depletion in the South, (42) 303.
- devastation, national control, (43) 42.
- devastation, prevention, (42) 347.
- development on undrained sand plain, (48) 42.
- distribution, factors affecting, (42) 142.
- districts, value for sanatoria, (42) 539.
- entomology in Lake States, (50) 845.
- entomology, recent work in, (47) 357.
- environment study, methods, (47) U.S. D.A. 746.
- Experiment Station, Lake States, field, (50) 240.
- Experiment Station, Southern, organization, (46) 398.
- Experiment Station, Wind River, activities, (49) 238.
- experiment stations, (46) U.S.D.A. 41.
- fertilization studies, (47) 815.
- fire—
 - insurance, classifying risks, (44) 148.
 - laws of California, handbook, (43) 42.
 - laws of Oregon, (42) 142.
 - of October, 1918, in Minnesota, (41) 48.
 - prevention handbook, (50) U.S. D.A. 141.
 - protection, (44) 641, Ohio 742.
 - protection and insurance, (44) 538.
 - protection, cooperative, in Georgia, (46) 645.
 - protection in Minnesota, (46) 237.
 - protection in New York State, (45) 239.
 - protection laws in Maine, (44) 742.

Forest—Continued.

- fire—continued.
 - protection, rôle of livestock grazing, (44) U.S.D.A. 239.
 - reports, (41) 243, 840; (42) 45.
- fires—
 - airplane patrol, (42) 347.
 - and climate in California, (42) 347.
 - and evaporation, (45) U.S.D.A. 320.
 - and lightning, (44) U.S.D.A. 121.
 - and weather, (50) 807.
 - control in Washington, (43) 748.
 - control, organization for, (50) 240.
 - control, use of airplanes in, (43) 543.
 - effect on Indian chir forests, (41) 840.
 - importance of duff moisture content in, (50) 544.
 - in California, (48) U.S.D.A. 841.
 - in Canada, (43) 840.
 - in Connecticut, (50) 544.
 - in New Jersey, (42) 142; (45) 840.
 - in Oregon, (42) 45.
 - in Oregon, handbook, (43) 748.
 - nature of injuries from, (43) 543.
 - prevention, (48) 841.
 - protection, (43) 747.
 - relation to relative humidity, (50) U.S.D.A. 743.
 - relation to weather conditions, (47) U.S.D.A. 315.
- firewarden's manual, (45) 239.
- flora of New South Wales, (43) 543.
- growth as affected by smoke, (44) 825.
- growth, climatic conditions controlling, (41) U.S.D.A. 417.
- Harvard, management, (46) 842.
- insect control, sunlight as factor, (43) 560.
- insect control, use of airplane in, (49) Ohio 352.
- insect control, value of slash burning, (50) Minn. 152.
- insects in Australia, treatise, (50) 256.
- insects in Dutch East Indies, (43) 450.
- insects in India, (41) 57.
- insects in India food plants, (45) 658; (48) 153.
- insects in Sweden, (41) 455; (44) 250.
- insects, notes, (44) 57; (46) 558.
- insects of Pacific slope, (46) 852.
- insects, plats for studying, (44) 754.
- insects, treatise, (50) 555.
- land—
 - classification, (41) 839.
 - in Himalayas, use of, (43) 543.
 - in United States, (41) U.S.D.A. 693.
 - treatment after logging, (42) 445.
 - valuation, manual, (46) 693.
- lands, erosion, control works, (45) 46.

Forest—Continued.

laws—

- French, handbook, (46) 141.
- in Austrian territory returned to Italy, (42) 642.
- in Canada, (42) 540.
- in Cochin China, (44) 148.
- in Massachusetts, (45) 840.
- in Minnesota, (44) 148.
- in new province of Italy, (43) 747.
- in Oregon, (43) 748.
- in Virginia, (42) 839.
- leaves, fertilizing value, (47) Miss. 217.
- legislation in Tasmania, (47) 837.
- lepidoptera, new species, (43) 853.
- lepidoptera, treatise, (48) 53.
- light, quality, (41) 330.
- line, factors governing, (50) 242.
- litter, agricultural value, (45) 330.
- litter, fauna of, (47) 551.
- litter, fertilizing value, (49) 814.
- localities in Massachusetts, sustained yield in, (48) 841.
- management, manual, (45) 644.
- mapping, methods, (43) 840.
- mapping, use of seaplanes in, (42) 445.
- marking rules, pathological, (41) 840.
- mensuration, (41) 840.
- mensuration, alinement charts in, (42) 239.
- mensuration, handbook, (46) 444, 693, 739.
- mensuration, textbook, (46) 341; (50) 647.
- nurseries, damping-off in, control, (45) U.S.D.A. 357.
- nurseries in New York State, (45) 239.
- of Haguenau, (44) 340.
- officers of the British Empire, list, (49) 643.
- operations, methods of financing, (43) 42.
- pathology, (48) Can. 51.
- pathology in Ontario, (48) 849.
- physiography in South Australia, (42) 122.
- planting, (45) Mich. 645; (48) Ohio 142.
- planting—
 - experiments, (42) Minn. 839; (49) 743.
 - in northern California, (50) 645.
 - in Ohio, (45) Ohio 240.
 - methods, relation to frost injury, (46) 236.
 - on the farm, (46) 42.
 - relation to evaporation and soil moisture, (47) 539.
- policy—
 - for Australia, (41) 838.
 - for Florida, (45) 349.
 - for Louisiana, (41) 243.
 - for Ohio, (42) Ohio 839.
 - national, (41) U.S.D.A. 149; (42) 239, U.S.D.A. 346, 444, 739; (45) 744; (47) 297.

Forest—Continued.

policy—continued.

- of American Paper and Pulp Association, (43) 542.
- of United States, (43) 746.
- preserve, development in New York State, (45) 239.
- production, research as aid, (48) 840.
- products—
 - chemical treatments, (47) 53.
 - laboratory, demonstration courses, (50) U.S.D.A. 41.
 - laboratory, establishment in Australia, (42) 99.
 - laboratory, importance and scope, (42) 540.
 - laboratory, work and aims, (48) U.S.D.A. 239.
 - manufacture and use, (42) 44.
 - of Malay Peninsula, (48) 239.
 - of Tonkin, inventory, (42) 642.
 - Philippine, for paper pulp, (43) 841.
 - Philippine, survey, (44) 640.
 - research in United States, (50) 141.
- protection in Canada, (42) 445.
- rangers, Spanish terms for, (46) U.S.D.A. 341.
- reconstruction and exploitation in France, (42) 141.
- regeneration in Germany, (43) 840.
- regions and types in New York State, (48) 640.
- regulation, American, treatise, (49) 238.
- renewal in France, (42) 840.
- renewal in Netherlands Indies, (41) 48.
- reproduction in Michigan, (46) 645.
- reproduction with fire protection in Adirondacks, (50) 646.
- research—
 - effect on forest policy, (43) 41.
 - in India, (48) 739; (49) 745.
 - Institute and College in India, (44) 696.
 - Institute, report, (42) 446; (44) 838.
 - phytometer method, (41) 327.
 - projects in North America, (44) 45.
 - recent developments, (49) 401.
 - relation to management, (43) 841.
- resources—
 - of Alaska, (45) 645.
 - of central Europe, (50) 647.
 - of Far Eastern Republic, (48) 541.
 - of Finland, (46) 237.
 - of New Zealand, (50) 545.
 - of Ontario, (49) 838.
 - of Pennsylvania, (49) 42.
 - of Southern States, (46) 541.
 - of the world, treatise, (50) 141.

Forest—Continued.

resources—continued.

- of Utah, conservation, (47) 836.
- survey, (43) U.S.D.A. 650.
- tabulating, (41) 244.
- roads, notes, (46) U.S.D.A. 489.
- school, Yale, progress, (44) 896.
- seed beds, treatment, (47) 154.
- seeds and plants, collection and distribution in Hawaii, (49) 143.
- seeds, delayed germination, (49) 141.
- seeds, effect of origin, (46) 41.
- Service, activities, U.S.D.A. (45) 744; (47) 147.
- Service, brush disposal methods, (49) U.S.D.A. 642.
- Service, Dominion, work, (50) 141.
- Service, rating scale for foresters, (42) 840.
- situation in United States, (50) 743.
- situation in Western Australia, (49) 837.
- slash, infected, disposal on timber areas, (42) 445.
- soils—
 - bacteriological studies, (49) Idaho 213.
 - effect of acid carbonate salts, (49) 814.
 - effect of rock on, (47) 118.
 - fertilization, (50) 621.
 - from Czechoslovakia, biochemical studies, (49) 511.
 - in Ceylon, analyses, (49) 617.
 - in Java, studies, (49) 16.
 - nitrification in, (41) 125.
 - of Sweden, aeration, (50) 318.
 - ultramicroscopic microbes in, (48) 619.
- species—
 - for South Africa, (45) 141.
 - frost resistance, (44) 239.
 - germination tests, (49) 745.
 - methods of thinning, (50) Mich. 242.
 - of China, (49) 745.
 - suitable for Zululand, (43) 42.
- statistics for several countries, (49) 144.
- studies, evaporimeter for, (41) U.S.D.A. 725.
- study in primary grades, (41) 298.
- survey of Moose River Lower Basin, (50) 39.
- survey, papers on, (46) 141.
- surveys, aerial, (47) 41.
- surveys, stereophotogrammetry in, (44) 46.
- surveys, technical guide, (41) 292.
- taxation in United States, (41) 244.
- thinning areas in Sweden, (42) 642.
- thinnings, classification, (49) 837.
- trails and highways of Mount Hood region, (44) U.S.D.A. 148.
- trees, *see* Trees.
- types, factors affecting distribution, (44) 46, 239.

Forest—Continued.

- types of United States, (46) 444.
- woods and trees, (42) 539.
- woods of Cyrenaica, (42) 540.
- Forestation—
 - and drought, (46) 42.
 - constructive program, (47) 746.
 - dry land, in India, (43) 150.
 - effect on water supply, (43) 16.
 - experiments, (47) Calif. 643.
 - in Belgian Kongo, (44) 340.
 - in Belgium, (43) 343.
 - in France, (41) 838.
 - in Great Britain, (44) 641.
 - in Hawaii, importance, (44) 838.
 - in India, (42) 44; (49) 838.
 - in Korea, (48) 541.
 - in Massachusetts, (44) 240.
 - in Mediterranean basin, (41) 744.
 - in Morocco, (44) 148.
 - in New York State, (45) 239.
 - in New Zealand, (43) 542, 747.
 - in Scotland, (41) 244.
 - in United Kingdom, (41) 343, 652, 743; (42) 539, 739.
 - in Zululand, (43) 42.
 - minimum requirements for, (50) 646.
 - of cut-over lands, (43) 343.
 - of ravine lands in India, (47) 347.
 - of sand dunes, (43) 651.
 - policy in South Africa, (42) 513.
 - with conifers, treatise, (41) 652.
- Forestry—
 - among the giant redwoods, (48) 448.
 - and our land problem, (48) 447.
 - bequest in Massachusetts, (48) 798.
 - biotic factor in, (50) 837.
 - College, Royal, in Italy, (42) 698.
 - education, (46) 896.
 - education—
 - and research, (50) 443.
 - and research in Great Britain, (41) 797.
 - for Indian service, (44) 896.
 - in Australia, (47) 837.
 - in England, (47) 298.
 - in Italy, (42) 698.
 - entomology as aid, (50) 844.
 - European, impressions, (47) 837.
 - experiments, (50) S.C. 646.
 - farm, in east Texas, (44) 838.
 - Federal and State, cooperation, (43) 441.
 - for private owners, (45) 441.
 - for profit, (49) 837.
 - for profit, treatise, (50) 242.
 - for returned soldiers, (42) 44.
 - for the farm, (44) U.S.D.A. 147.
 - handbook, (42) 43; (43) 542; (47) 346; (48) 238, 739.
 - high school, course of study, (45) 92.
 - in Adirondacks, cost data, (42) 445.
 - in Africa, (43) 839.
 - in Ajmer-Merwara, (43) 241.
 - in Appalachians as affected by changed conditions, (41) 838.
 - in Argentina, (44) 538.

Forestry—Continued.

- in arid regions, (43) 840.
- in Australia, (42) 239, 839; (43) 150; (44) 46, 838; (45) 349; (46) 541; (47) 837.
- in Austria-Hungary, statistics, (42) 291.
- in Baluchistan, (41) 449; (43) 150; (44) 46; (46) 238; (48) 142; (49) 240.
- in Bombay, (43) 748.
- in British Columbia, (43) 747; (44) 838; (47) 748; (49) 838.
- in British Guiana, (45) 646.
- in Burma, (42) 539.
- in California, (43) 442; (45) 142.
- in Canada, (41) 243, 838; (42) 445; (43) 442, 542; (45) 839; (46) 141; (47) 346; (49) 837; (50) 344.
- in China, (46) 141.
- in China, progress, (44) 240.
- in Cochin China, (44) 148.
- in Connecticut, (49) 238.
- in Czechoslovakia, (48) 791.
- in Douglas fir region, (43) 343.
- in Dutch East Indies, (46) 41.
- in early England, (43) 442.
- in Federated Malay States, (43) 542; (47) 444; (50) 40.
- in Finland, (50) 838.
- in France, (42) 540, 738; (43) 442; (47) 297.
- in France, treatise, (44) 741.
- in Great Britain, (46) 541; (48) 239, 841; (49) 537; (50) 544.
- in Hawaii, (41) 149, 150, 736; (45) 744; (49) 143.
- in Illinois, (43) 542.
- in India, (41) 150, 449, 652, 744; (42) 43, 738; (43) 150, 651; (44) 46, 240, 641, 742; (45) 142, 239, 646; (46) 238, 541, 645; (47) 644, 748, 837; (48) 142, 240, 345, 841; (49) 240, 441, 537, 643, 745; (50) 40, 141, 242, 344, 345, 545, 647.
- in Indiana, (46) 237.
- in Indo-China, (49) 42.
- in Interior Department, (43) 148.
- in Ireland, (43) 747.
- in Italy, (43) 747.
- in Japan, (41) 343; (50) 242.
- in Korea, (43) 839.
- in Louisiana, (45) 142.
- in Maryland, (47) 41; (50) 838.
- in Massachusetts, (41) 743; (43) 343, 839; (44) 641; (45) 442; (47) 240; (49) 441.
- in Michigan, (48) Mich. 344; (49) 441.
- in Minnesota, (41) 243; (43) Minn. 839; (44) 46.
- in Morocco, (43) 651.
- in Nehasane Park, (44) 148.
- in Netherlands India, (43) 748.
- in New Brunswick, (45) 349; (47) 41.
- in New Hampshire, (45) 442.

Forestry—Continued.

- in New Jersey, (45) 840; (47) 346.
- in New South Wales, (46) 843; (49) 342; (50) 545.
- in New York State, (42) 642; (45) 239; (46) 843; (48) 739.
- in New Zealand, (41) 46, 343, 541; (43) 542, 651, 747; (45) 840; (47) 41; (50) 545.
- in Nigeria, (44) 240; (49) 143.
- in Norway, (46) 898; (49) 745.
- in Ohio, (49) Ohio 342.
- in Ontario, (45) 239; (46) 41; (49) 838.
- in Oregon, (46) 340; (47) 346; (50) 647.
- in Paraguay, (44) 538.
- in Pennsylvania, (42) 642; (43) 442, 839; (49) 42.
- in Philippines, (42) 539; (44) 641; (46) 645; (48) 345; (50) 344.
- in Porto Rico, (43) 241; (45) 646.
- in Quebec, (45) 840.
- in Queensland, (44) 742; (46) 340; (48) 541.
- in Rhode Island, (45) 840.
- in Rhodesia, (43) 840; (44) 641.
- in Scotland, (42) 540.
- in South Australia, (43) 42; (48) 740; (50) 545.
- in Sweden, (44) 538; (50) 743.
- in Switzerland, (44) 148; (46) 237.
- in Tasmania, (46) 739.
- in Texas, (43) 747.
- in the Andamans, (50) 39.
- in Uganda, (48) 142, 740; (49) 42.
- in Union of South Africa, (45) 839; (46) 541.
- in United Kingdom, (45) 349.
- in United Kingdom, treatises, (41) 343, 743.
- in United States, status, (46) 340.
- in Utah, (46) U.S.D.A. 341.
- in Vermont, (45) 539.
- in Virginia, (42) 839; (48) 43.
- in Washington, (44) 641; (49) 142.
- in West Persia, (44) 148.
- insects in relation to, (42) 153.
- instruction—
 - for Brazil, (43) 442.
 - higher, in Prussia, (42) 394.
 - in Prussia, beginnings, (44) 896.
 - university, (42) 493.
- international, bibliography, (49) 342.
- laws in Virginia, amendments, (48) 43.
- laws, State, of 1921, (48) U.S.D.A. 43.
- lessons on home woodlands, (44) U.S.D.A. 94.
- net revenues, determination, (44) 46.
- occupations in, (47) 695.
- of the Prophets, (43) 148.
- on private lands, (41) 243, 541.
- personnel, organization and training in Greece, (45) 92.

Forestry—Continued.

private—

- adjacent to national forests, (42) 839.
- economics of, (43) 42.
- in France, (42) 839.
- in Pennsylvania, (42) 445.
- State control for, (42) 444.
- suggestions, (42) 444.
- problems of the United States, (49) U.S.D.A. 341.
- projects in Sweden, (49) 42.
- projects in Wisconsin, (44) 538.
- relation to land economics, (45) 349.
- relation to soils, (50) Mich. 419.
- research at Harvard and Yale, (48) 798.
- research in Canada, (46) 739.
- review of literature, (41) 743.
- rôle in economic entomology, (48) 851.
- School, Yale, notes, (46) 399.
- science of, (43) 343.
- station at Avondale, work, (49) 743.
- studies, (45) N.Dak. 239; (48) N.Dak. 239; (49) N.H. 341.
- survey of Illinois, (49) 341.
- talks on, (50) 240.
- textbook, (46) 236; (48) 539.
- treatise, (41) 243, 540; (43) 343, 442, 651.
- Tri-State Conference, (43) 441.
- use of aircraft in, (44) 148.

Forests—

- and forestry, (50) U.S.D.A. 240.
- and trees, treatise, (44) 238.
- Appalachian, scientific research, (50) 240.
- Bhabar, management, (47) 43.
- bog, destruction and replacement, (49) 239.
- brush disposal, (41) 839.
- colonial, in France, (42) 446.
- deciduous, prairie inclusions in, (47) 442.
- destruction in China, effect, (45) 840.
- Douglas fir, natural production, (43) 650.
- edaphic limit in prairie region, (49) 439.
- effect of frost, (47) 345.
- effect on climate, (42) 642; (44) 618.
- effect on run-off, (47) 210.
- effect on stream flow, (46) 141.
- effect on water power supply, (41) 785.
- effect on water resources, (44) 417.
- fertilizer experiments, (43) 24.
- German, utilization during the war, (44) 240.
- growth and yield statistics of the Jura, (42) 839.
- growth data, (43) N.H. 41.
- hardwood, in Appalachians, management, (43) 42.
- hardwood, lumbering in New York, (42) 444.

Forests—Continued.

- heath, of Finland, regeneration, (46) 738.
- industries dependent upon, (42) 540.
- injury from gas and smoke, (46) 738.
- kauri, management, (41) 46.
- mountain, of Italy, (45) 894.
- national—
 - cooperation with adjacent private lands, (42) 839.
 - grazing regulations, (43) 148; (45) 539; (46) U.S.D.A. 542.
 - in California, campers' handbook, (46) U.S.D.A. 341.
 - in Oregon, recreational features, (42) U.S.D.A. 141.
 - insect control, (43) 148.
 - management, (47) U.S.D.A. 147.
 - mapping, aerial photography for, (41) 244.
 - nurseries, weed control in, (43) 42.
 - of New Mexico, (48) U.S.D.A. 239.
 - of southern Appalachians, (50) U.S.D.A. 39.
 - policies, (43) 839.
 - range development, (42) 540.
 - range management on, (41) U.S.D.A. 565.
 - recreational features, U.S.D.A. (41) 149, 344; (42) 141, 142, 348; (43) 543, 747; (44) 239, 538.
 - recreational features, (43) 442.
 - relation to water supply, (42) 681.
 - roads through, (43) U.S.D.A. 442.
 - statistics of, (42) U.S.D.A. 348.
 - stumpage appraisals, (42) 239.
 - survey of flora, (44) 640.
 - timber resources in Alaska, (45) U.S.D.A. 350.
 - trail construction, (49) U.S.D.A. 790.
 - trespass laws and investigative methods, (49) U.S.D.A. 537.
- nitrification of soils and regeneration, (41) 125.
- northeastern, humus and root systems in, (48) 41.
- of Alaska, size and nature, (47) 240.
- of Australia, (49) 440.
- of Brazil, (48) 640.
- of British Columbia, (41) 838.
- of California, (50) 240.
- of Canada, (50) 344.
- of Canada, limitations of, (42) 540.
- of Cochin China, (44) 148.
- of Delaware Peninsula, (41) 244.
- of France, effects of war on, (42) 287.
- of French Africa, conservation, (44) 148.
- of French colonies, (41) 150, 743; (43) 651.
- of French Guiana, (48) 640.
- of Germany, resources, (41) 244.
- of Greece, (42) 540; (43) 241.
- of Idaho, plant associations, (48) 641.

Forests—Continued.

- of India, (41) 522, 839.
- of Italian lake region, (46) 42.
- of Madagascar, notes, (49) 440.
- of Maryland, (46) 842.
- of Mexico, (42) 45.
- of Michigan, (50) 743.
- of Montana and Idaho, (50) 240.
- of New England, historical account, (49) 239.
- of New Jersey, geography, (41) 244.
- of New South Wales, (47) 443.
- of New York State, treatise, (49) 142.
- of north Russia, economic importance, (49) 240.
- of Quebec, (42) 445; (43) 149; (50) 647.
- of Santa Lucia Mountains, geobotany, (41) 220.
- of Saxony, (42) 45.
- of South Brazil, moisture and illumination, (43) 241.
- of Sweden, (45) 141.
- of Sweden, insects affecting, (44) 250; (46) 51.
- of Switzerland, exploitation, (44) 240.
- of Transcaucasia, (42) 840.
- of Union of South Africa, (42) 45.
- of United States in relation to lumber export, (41) U.S.D.A. 448.
- of Virginia, (42) 540, 642.
- of West Africa, (43) 839.
- of West Australia, (41) 743; (42) 45; (44) 47.
- on sand hills, (44) 46.
- Philippine, minor products, treatise, (48) 841.
- precipitation and evaporation in, (42) 117.
- protection in Maine, (44) 742.
- revenues from, in Great Britain, (50) 544.
- second growth hardwood, in Michigan, (50) Mich. 241.
- Sierra, results of cutting in, (50) U.S.D.A. 241.
- softwood, protecting, (50) 837.
- State, (47) Ohio 697.
- State, economic aspects, (43) 343.
- State, for Massachusetts, (43) 543.
- tapestry, of Hawaii, (43) 747; (44) 730.
- telephone communication in, (45) 540.
- thinning experiments, (46) 237.
- tropical, of Africa, (42) 446.
- tropical rain, ecology of, (43) 241.
- upland and bottomland, soil temperatures, (46) 211.
- vanishing in United States, treatise, (49) 341.
- white pine, in New England, (43) 149.
- windfall injuries, (44) 537; (46) 644.
- yield as affected by thinning, (49) 42.

Forficula auricularia, *see* Earwig.

Formaldehyde—

- analysis, (46) 114.

Formaldehyde—Continued.

- and carbohydrates, synthesis, (47) 728.
- and corrosive sublimate, comparison, (46) Iowa 342.
- as fly poison, variation in effect, (45) 257.
- as milk preservative, (42) Mo. 207.
- as nutrition for algae, (46) 824.
- detection, (50) 803.
- disinfecting power, (43) 78.
- drip for onion smut, (45) 543.
- dry treatment of oats, (48) 645.
- effect on activity of amylases, (46) 707.
- effect on grain, relation to condition of seed coat, (45) 245.
- effect on plants, (46) 544.
- effect on plumule development, (50) Calif. 44.
- effect on protein hydrolysis, (43) 110.
- effect on wheat, (48) 127.
- for bean seed treatment, (49) 841.
- for cereal smut, (42) Calif. 47; (43) 150; (45) 49, Mich. 242; (48) 47; (50) 347.
- for conservation of liquid manure, (42) 721.
- for potato seed treatment, (46) 650; (47) Mich. 129, Mich. 149, Minn. 332, Minn. 352, Ariz. 543; (49) 47, Idaho 746.
- for potato seed treatment, maintaining standard concentration, (50) 654.
- for seed disinfection, (41) 154, 245; (47) 45.
- for tobacco root rot, (43) Mass. 846.
- for wheat smut, (44) Oreg. 841, 843; (45) Wash. 242.
- fungicidal value, (45) Iowa 648.
- hot, treatment for potato scab, (46) 549; (47) 47.
- in conserved liquid manure, effect on plants, (46) 518.
- in milk, effect on vitamin content, (49) 459.
- in plants, (45) 528; (50) 525.
- inhibitive effect on fermentation, (42) 609.
- phloroglucin test, degree of alkalinity necessary, (43) 804.
- polymerization to sugar, (42) 528, 627; (43) 202.
- solutions, analyses, (41) Mich. 443.
- sterilization of soil for lettuce drop, (49) 246.
- synthesis of glycine from, (48) 411.
- treated wheat, effect on germination, (46) 241.
- treatment, effect on wheat, (47) Oreg. 148.
- treatment of barley, tests, (49) 840.
- Formalin, *see* Formaldehyde.
- Formates production, (43) 220.

Formic acid—

- determination, (41) 112.
- effect on egg production, (50) 576.
- formation from cane sugar, (50) 805.
- production from alkali-sawdust fusion, (41) 314.

Formica—

- exsectoides in forest plantations, (47) 761.
- exsectoides, proctotrypid inquiline with, (42) 752.
- spp., pupae of as poultry feed, (50) 576.

Formicidae of France and Belgium, (41) 360.

Formol, use as soil disinfectant, (42) 718.

Formulas as summary of biological data on insects, (47) 551.

Foulbrood—

- Act of Canada, text, (47) 856.
- American, (42) U.S.D.A. 857, U.S.D.A. 859; (45) Wis. 462.
- control, (41) Mich. 463; (45) 159.
- disinfection of frames, (47) Mich. 163.
- distribution in Wisconsin, (45) 852.
- effect of sodium hypochlorite, (49) 156, Wis. 653.
- European, behavior of bees affected by, (42) U.S.D.A. 859.
- European, notes, (43) U.S.D.A. 58; (44) 60.
- in Connecticut, (41) Conn.State 158.
- law in Texas, (42) Tex. 362.
- notes, (43) Mont. 758.
- papers on, (47) 259.

Four-H clubs, *see* Boys' clubs and Girls' clubs.

Fowl—

- and pheasant hybrids, sterility, (41) 472.

cholera—

- diagnosis, (41) 287.
- immunization, (42) R.I. 78; (44) 482, 782, 876; (47) 287, Nebr. 787; (48) 779.
- immunizing value of commercial vaccines, (43) Nebr. 887.
- notes, (48) 579, Calif. 579.
- serum, transfer of immunity from, (48) 675.
- serum treatment for, (46) 196.
- studies, (48) Calif. 584.
- summary, (49) Mich. 482.
- treatment, (43) 586.
- vaccine, stability, (50) 282.
- vaccines, value, (45) 578.
- value of bacterins for, (44) Calif. 782.

diseases, (42) 681.

mite, tropical, life history and control, (42) U.S.D.A. 656.

mite, tropical, notes, (49) 381.

nematode, new, (41) 874.

nematode, studies, (44) Kans. 281.

parasites, (42) 681.

pest in Argentina, (46) 184.

Fowl—Continued.

pest virus, resistance toward cell-destroying influences, (47) 181.

plague in Argentina, studies, (42) 383.

plague in Holland, (41) 784.

scab, unusual form, (46) 885.

tapeworms, transmission, (41) 685, 881.

tick, eradication, (42) U.S.D.A. 252.

tick, summary, (47) 559, 857.

tuberculosis in Iowa, (41) Iowa 88.

typhoid—

diagnosis, (41) 287.

epizootic, in France, (45) 183.

group, organisms, (50) 185.

in France, papers on, (43) 84.

serum treatment for, (46) 196.

vaccine for, (46) Kans. 485.

Fowler's solution, toxic dose for dogs, (49) 381.

Fowls—*see also* Chickens, Hens, Poultry, etc.

acquired skeletal deformities, (44) 269.

Andalusian, color inheritance, (41) Kans. 76.

anthelmintics for, (46) 687.

autopsies, observations on, (50) 82.

blood pressure and pulse, (50) 82.

brachydactyly in, (42) 765.

brooding habits of capons, (41) 871.

calcium metabolism, (43) N.Y.State 574.

caponizing, (41) Md. 180, 774.

castration through meat feeding, (44) 469.

cholesterol content of blood, (41) 773.

close inbreeding in, effects, (49) Conn. Storrs 575.

color of egg yolk and body fat as affected by feeds, (44) 70.

Cornish, new variety, (42) 268.

curvature of the spine in, (44) 881.

digestive system, (47) 286.

diseases of head, diagnosis, (46) 778.

effect of alcohol on heredity in, (42) 766.

effects of castration, (44) 468.

fat content of blood, (41) 773, 774.

fecundity, anatomical basis, (47) 75.

fertility experiments, (41) 774, 871.

gonads of, studies, (44) 467; (50) 530.

hen-feathered, studies, (44) 468, 469, 470; (48) 166.

hen-feathering, genetic factor for, (44) 470.

hermaphrodite, studies, (42) 466.

heterodactylous, left sided incidence of extra digit, (44) 469.

immunity to plague, (43) 278.

inheritance—

of blue in, (47) 276.

of color in, (50) 227.

of leg-feathering, (41) 472.

of plumage color in crosses, (48) 165.

Fowls—Continued.

- inheritance—continued.
 - of silkiness in, (45) 877.
 - studies, (41) N.J. 75.
- interstitial cells in, (42) 668.
- male, feminized, (41) 269.
- Mendelian experiment, results, (44) 870.
- new nematode in, (42) 180.
- normal temperature, (48) 381.
- number of vertebrae in, (48) 764.
- physiology of reproduction, (47) 75, 275.
- pigmentation, relation to fecundity, (44) 70.
- preferential mating, studies, (42) 562.
- production of eye color in, (43) 866.
- rate of ovulation during pullet year, (45) 70.
- respiration, (48) 680.
- Rhode Island Red, egg production, (41) 179.
- sex reversal in, (50) 530.
- sex sequence, (41) N.J. 75.
- tuberculin and eyelid test, (46) 280.
- vaccination against chicken pox, (49) 183.
- visceral anatomy, (43) Wash. 397.
- wild, conservation laws of Maryland, (49) 250.

Fox—

- biscuits, analyses, (41) Can. 565.
- farming, history and common practices, (49) U.S.D.A. 471.
- farming industry, problems, (46) 770.
- farming, problems, (45) 273.
- feces, examination, (48) 383.

Foxes—

- hookworm remedies for, (46) 184, 185.
- management and feeding, (49) Wis. 675.
- parasites of, (46) 686, 886.
- parasites of, treatment, (49) 382.
- ranch, food requirements, (46) 770.
- ranching in Canada, (48) 668.
- red, breeding, (48) 768.
- silver black, parasites of, (47) 589.
- silver, feeding and management, treatise, (45) 378.

Foxglove, smooth-stemmed form, studies, (41) 523.

Foxtail—

- bacterial disease, notes, (41) Ark. 748; (50) 349.
- hay, injury to sheep, (41) Nev. 782.
- meadow, culture experiments, (49) 735.
- midge in Denmark, (41) 460.
- millet, life history, (49) 528.
- millet, smut affecting, (45) 48.

Fractionation in analysis, (43) 503.

Frankliniella—

- cephalica masonii, notes, (43) 851.
- cephalicus, notes, (47) U.S.D.A. 157.
- key, (41) 847.
- occidentalis, notes, (49) 850.
- spp., studies, (47) Fla. 655.

Frankliniella—Continued.

- tritici—see also Flower thrips and Wheat thrips.
 - notes, (49) 848.
 - varicorne n.sp., description, (42) 648.
- Frear, W., biographical sketch, (46) 197.
- Freemartin—
 - and its reciprocal, (45) 372.
 - early stage and history of interstitial cells, (47) 863.
 - gonads, structures and homologies, (45) 371.
- Freemartins—
 - anatomical studies, (45) 372.
 - body measurements, (44) 67.
 - cause, (48) 869.
 - notes, (41) 672.
- Freesia disease, notes, (43) 243.
- Freesias, breeding, progress in, (41) 448.
- Freezing—
 - effect on autolysis of meat, (49) 11.
 - effect on plants, relation to manner of thawing, (43) 432.
 - effect on wheat composition, (43) 501.
 - injury of seed corn, studies, (42) Nebr. 437.
 - point depressions as affected by irrigation water, (42) 119.
- French—
 - Agricultural Congress, editorial, (42) 701.
 - Agricultural Congress, proceedings, (42) 790.
 - colonial dominions, resources and needs, (48) 691.
- Friesian Herdbook Association, (48) 78.
- Frijole bean as forage crop, (41) Tex. 36.
- Fringed nettle grub, notes, (49) 455.
- Frit fly—
 - European, in North America, (42) 654.
 - habits, (46) 158.
 - in winter wheat, (46) 460.
 - on oats, effect of early sowing, (50) 55.
 - relation to blindness in oats, (45) 361.
- Froghopper blight—
 - on sugar cane in Trinidad, (42) 356.
 - relation to rainfall, (42) 510.
- Froghoppers—
 - grass-feeding, life cycle, (46) Conn. State 154.
 - remedies, (41) 456.
- Frontina archippivora, notes, (48) Hawaii 355.
- Frost—
 - and fruit in southern Ohio, (45) U.S.D.A. 320.
 - and muck soils, (47) Mich. 117.
 - as affected by altitude and topography, (43) 417.
 - causes in muck soils, (48) 815.
 - control, effects on fruit trees, (42) 440.
 - data for cotton planting, (50) U.S.D.A. 132.

Frost—Continued.

- dates, calculation, (47) U.S.D.A. 615.
- effect on—
 - critical periods of plant growth, (43) 207.
 - keeping quality of sweet potatoes, (46) 135.
 - soils, (44) 812.
 - sugar cane buds, (47) 737.
- forecasting, (43) 16.
- forecasts in California fruit districts, (48) 808.
- in temperate climates, geological importance, (42) 423.
- injury, protection from, (43) U.S.D.A. 237.
- injury to—
 - cereals and legumes, (43) 432.
 - conifers, pathological anatomy, (48) U.S.D.A. 729.
 - forests, (44) 239.
 - tomatoes, (48) U.S.D.A. 49.
- late spring, effect on forests, (47) 345.
- maps of United States, (44) 208.
- necrosis of potato tubers, (42) Wis. 148.
- penetration in soil, (44) 618.
- prediction, (42) 214; (44) 716; (50) 208.
- prevention, (43) Ohio 397; (44) U.S.D.A. 119, 811.
- protection, (44) 535; (49) 615; (50) U.S.D.A. 115.
- protection in Sao Paulo, (49) 315.
- resistance in flax, (49) U.S.D.A. 332.
- warnings, physical laws as basis, (46) 208.

Frostless and vegetative periods, relation, U.S.D.A. (41) 118, 716.

Frosts—

- Cape Cod cranberry, (43) U.S.D.A. 15.
- of 1916–17, effect on vegetation, (43) 326, 431.
- of 1916–17 in Great Britain, effect on vegetation, (41) 236.
- spring, date chart, (43) U.S.D.A. 118.

Fructose—

- determination, (46) 506.
- determination in presence of other sugars, (50) 614.
- determination, use of iodine in, (48) 414.
- fermentation of, (42) 709.
- fermentation products, (48) 108.
- preparation, (47) 802.
- sirup from artichokes, (47) 202.

Fruit—

- aphids, life history and control, (44) U.S.D.A. 59.
- beverage investigations, (49) Calif. 412.
- blossom bacillus, studies, (41) 841.
- brown rot, notes, (43) Okla. 44; (45) 652.

Fruit—Continued.

- brown rot, seasonal history, (48) Can. 450.
- brown rot, spraying for, (47) Calif. 649.
- brown rot, studies, (41) 348, 844; (43) 48, 246.
- brown rot, survey, (45) Can. 841.
- bud formation—
 - date, (49) 834.
 - effect of light, (43) N.H. 36.
 - effect of shading and ringing, (49) N.H. 742.
 - effect of soil environment, (44) Va. 739.
 - effect of spur defoliation, (45) Oreg. 237.
 - factors affecting, (43) 742; (46) 38; (49) 48.
 - in small fruits, (50) 37.
 - localization of factors, (46) Mo. 337.
 - studies, (43) Okla. 36; (47) N.H. 436; (49) Oreg. 532, 833.
- buds—
 - analyses, (45) Mo. 221.
 - development, (45) 238, Okla. 450.
 - development, relation to orchard practices, (48) 837.
 - freezing, (43) 743; (44) 740.
 - moisture content as index of hardiness, (43) 40.
 - selection, (41) 835.
- butters, manufacture, (46) 755.
- butters, recipes, (47) 113.
- by-products, experiments with, (42) 137.
- canneries, inspection, (48) U.S.D.A. 60.
- chlorosis, notes, (47) N.Mex. 444.
- citrus, *see* Citrus fruits.
- containers, standard, (41) 443; (44) 144; (45) U.S.D.A. 135.
- containers, State law for, (41) N.Dak. 763.
- cost of handling, (44) N.Dak. 360.
- crop, poor, as affected by meteorological conditions, (45) U.S.D.A. 320.
- crops and markets in New Brunswick, (43) 833.
- diseases, (45) 444; (47) Minn. 541; (49) 540; (50) Minn. 148.
- diseases—
 - and pests in Cuba, (43) 438.
 - and pests in New York, (41) 245, 248.
 - and pests in Oregon, (43) 656.
 - and remedies, (43) 246.
 - following neglect after freeze, (46) Ohio 348.
 - in England and Wales, (49) 645.
 - in field and during transit, (49) 845.
 - in India, (43) 445.
 - in New York State, (49) 442, 445.

Fruit—Continued.

diseases—continued.

- in Ontario, (42) 150, 544.
- literature on, (42) 541.
- farming in New Hampshire, (43) 237.
- farms, business analysis, (49) Idaho 88.
- fed cows' milk, cheese from, (46) 276.
- flies—
 - Ethiopian, new genera and species, (45) 257.
 - new genera and species, (44) 255.
 - of Brazil, (41) 758; (43) 258.
 - of Japan, studies, (42) 652.
 - of Philippines, (43) 56.
- fly, Argentine, notes, (41) 552.
- fly in Queensland, (48) 752.
- fly larvae in cold storage, (50) 359.
- fly, Mediterranean, in Hawaii, studies, (42) 654; (50) 54.
- fly, Mediterranean, menace to America, (50) 259.
- fly, Mediterranean, notes, (47) U.S. D.A. 157.
- fly on jujube, (49) 849.
- fly parasite, new, from Java, (47) 761.
- fly, parasites of, (50) 255.
- growing, (47) Wash. 141.
- growing—
 - climatic factors, (41) 340, U.S.D.A. 417.
 - cooperative, in Massachusetts, (46) 695.
 - development in New Brunswick, (45) 44.
 - disease factor in, (42) Wash. 599.
 - from seed, (44) 145.
 - in Atlixco Valley, (43) 835.
 - in Australia, (41) 238.
 - in British Isles, (46) 233.
 - in Denmark, (41) 444.
 - in Great Britain, (41) 538.
 - in India, improvement, (41) 340, 522, 837.
 - in Morocco, (43) 835.
 - in North Carolina and temperature belts, U.S.D.A. (49) 314, 337.
 - in Ontario, (49) 592, 593.
 - in semiarid Northwest, (41) 238.
 - in South Africa, (41) 835.
 - in Spain, treatise, (41) 237.
 - treatise, (43) 835; (44) 534; (49) 37.
- industries in Italy, (43) 438.
- industry—
 - and trade of Chile, (48) U.S.D.A. 536.
 - in Argentina, (45) 345.
 - in California, (41) 237, 340; (45) 236.
 - in New York State, (50) 540.
 - need for development in France, (43) 195.
 - of South Africa, (43) 148.
 - survey, (45) P.R. 638.

Fruit—Continued.

- juice beverages, imitation, manufacture, (46) 113.
- juice powder, apparatus for making, (46) 11.
- juices—
 - and their substitution, (41) 66.
 - as beverages, (41) 467.
 - carbonated beverages from, (48) Calif. 507.
 - citric acid content, determination, (41) 804.
 - clarification, (46) U.S.D.A. 616.
 - clarification and preservation, (45) 719.
 - clarification with enzymes, (47) 206.
 - concentrated, antiscorbutic value, (41) 470; (46) 261.
 - conductivity measurements, (42) 228.
 - detection of apple juice in, (47) 807.
 - dried, antiscorbutic value, stability of, (43) 460.
 - equipment for manufacture, (43) Calif. 717.
 - home preservation, (47) Mich. 614.
 - methyl anthranilate, detection, (45) 207.
 - preparation, (41) 739.
 - raw and cooked, pH of, (41) 763.
 - spectroscopic titration, (42) 612.
- "little leaf," studies, (41) 452.
- market at Kansas City, (43) U.S.D.A. 595.
- market in Philadelphia, (45) U.S.D.A. 89.
- mites, injurious, in Pennsylvania, (48) 654.
- pests, common but unfamiliar, (49) 599.
- pit meal, digestion trial, (45) 774.
- plantations, mixed, in Belgian Kongo, (45) 743.
- plantations, sanitation in, (45) 355.
- products, home manufacture, (47) 112.
- products, preservation and use, (47) Calif. 613.
- rot, remedy, (44) Ohio 151.
- scab, notes, (43) Okla. 44.
- scale, European, in Pennsylvania, (41) 164.
- seeds, methods of handling, (48) 443.
- silver-leaf disease, notes, (41) 750; (42) 48, 150; (43) 246.
- spurs and bark as affected by nitrogenous fertilizers, (48) 236.
- spurs, carbohydrate content, seasonal changes and translocation, (47) 729.
- stock industry in Europe, (48) 236.
- stocks—
 - American-grown, (41) 835.
 - and scions, relation between, (44) 535; (48) Calif. 534.

Fruit—Continued.

stocks—continued.

- identification, (49) Calif. 637.
- Paradise, selecting and propagating, (43) 238.
- rooting from scion, (44) Iowa 440.
- studies, (44) 145; (47) 238, 340.
- tests, (42) 737.
- used in propagation, (45) 538.

tree—

- borers, control, Pa. (43) 554; (44) 757.
- brown bark spot, Mont. (46) 343; (47) 843.
- chlorosis, (42) 48; (44) 49.
- chlorosis, effect on composition of fruits, (50) 248.
- collar rot, notes, (47) 152.
- fire blight, notes, (47) 152.

tree leaf roller—

- control, (44) Oreg. 850; (45) 854; (48) Wash.Col. 553; (49) Mont. 152, Mont. 251, Mont. 852; (50) 844.
- notes, (45) Mont. 359, 550; (48) Mich. 251; (49) Idaho 756.
- oil sprays for, (46) 855.
- summary, (46) 156, 855; (49) Mont. 254.

tree—

- leaf scorch, (49) 48.
- roots, anatomical studies, (48) Calif. 534.
- rots, symptoms and treatments, (45) 451.
- sun scald, factors affecting, (44) Calif. 743.

trees—

- alternate bearing, (46) 735.
- as affected by grass, (43) 237.
- as bushes, culture, (42) 534.
- blooming and ripening dates, climatic effect, (49) N.Y.Cornell 338.
- canker fungus on, (44) 842.
- central wire bracing, (47) Calif. 536.
- combined treatment for insects and cryptogamic diseases, (47) 48.
- condition, (44) N.Dak. 40.
- dormancy in, (50) Minn. 125.
- dusting v. spraying, (42) 544; (44) Minn. 745.
- dwarf, studies, (49) Wis. 644.
- effect of climatic conditions, (50) U.S.D.A. 114.
- fertilization as affected by bees and rain, (47) 128.
- fungus diseases, (44) 346.
- girdled, bridge grafting, (43) Ohio 340; (44) Pa. 741.
- growth and yield, relation to orchard practices, (44) Oreg. 833.

Fruit—Continued.

trees—continued.

- inarching of, (44) 535.
- insects affecting, (46) 656, 852; (50) 51, 153.
- insects affecting in Burma, (45) 657.
- manuring experiments, (44) 145.
- mixed sprays for, (47) 152.
- nitrogen fertilizers for, (43) Oreg. 145.
- nutritive condition measured by catalase activity, (50) 36.
- of Spain, catalogue, (44) 40.
- old, grafting, (42) 534.
- planting methods, (45) Ill. 44.
- pollination experiments, (43) 237.
- protection from frost, (43) U.S. D.A. 237.
- protection from rodents, (43) Ohio 340.
- pruning, (41) 238, 444, 835; (45) 238; (48) Mich. 536.
- pruning experiments, (45) Ind. 134; (47) Calif. 639; (49) N.Y. Cornell 637.
- pruning, grafting, and budding, treatise, (45) 135.
- pruning, response to, (43) 644.
- pruning wounds, covering for, (42) Calif. 833.
- retarding flowering of, (42) 534.
- ringing and notching experiments, (49) 833.
- root development, (46) 38; (48) 736; (49) 235.
- spacing experiments, Calif. (47) 638; (48) 534.
- spray schedules, (47) Wash. 140.
- spraying, (41) Mich. 43, 59; (48) 152; (49) Ill. 338.
- spraying experiments, (41) Iowa 237, Mo. 650.
- top grafting, (46) Wash. 498.
- trained to special forms, treatise, (43) 743.
- transpiration rate as affected by irrigation, (48) 236.
- transplanting, (43) Mo. 143; (46) 839.
- treatment with arsenicals, (45) 45.
- valuation, methods, (42) 238.
- war devastated, appraising, (43) 835.
- windbreaks for, (42) Minn. 834.
- winter injury, (43) 656, 657; (46) 139.
- winter injury in 1917-18, (42) 343, N.J. 835.
- winter study, (46) 839.
- wounds in, repairing, (48) Can. 37.
- young, pruning, (42) Calif. 138, 534; (44) 535.
- worms of British Columbia, (45) 658.

Fruit—Continued.

- worms, studies, (44) 653.
- wraps, oiled, for apple scald, (50) 750.
- Fruits—
 - acclimatization, (50) Alaska 539.
 - American, markets in China, (44) U.S.D.A. 640.
 - American, trade in Australasia, (44) U.S.D.A. 741.
 - analysis, official methods, (44) 9.
 - as affected by freeze, (48) N.J. 339.
 - Bacillus botulinus* in, (44) 763; (49) 860.
 - bacterial gummosis, control, Calif. (48) 542, 543.
 - blooming dates, (41) N.J. 41.
 - blooming dates in Niagara Peninsula, (42) 138.
 - blooming dates in South Africa, (41) 835.
 - Brazilian, possible adaptation in Florida, (49) 140.
 - breeding, (46) 839; (47) Minn. 338; (48) 736; (50) Minn. 140, Can. 339.
 - breeding—
 - and selection, (42) 637; (47) S.Dak. 438.
 - experimental accuracy in, (50) 36.
 - experiments, (42) 137; (43) 742; (44) Minn. 739; (45) 734; (46) 39; (49) S.Dak. 533.
 - experiments in Ontario, (49) 436.
 - farm, report, (44) Minn. 740.
 - sterility studies, (50) Minn. 130.
 - British imports, (48) U.S.D.A. 536.
 - California, culture, (42) 440.
 - canned, microorganisms in, (42) 164.
 - canned, oxygen and perforations in, (49) 856.
 - canning—*see also* Canning.
 - cold pack method outfits, (43) 808.
 - in the home, (46) U.S.D.A. 208.
 - temperature changes, (45) U.S.D.A. 560.
 - Chinese, collected by Meyer, (41) 742.
 - commercial utilization and conservation, (42) 615; (45) 665.
 - copper determination in, (44) 62.
 - crops and markets in New Brunswick, (45) 438.
 - crystallized, summary, (46) 755.
 - culture, (43) Nebr. 644; (45) Guam 43, Can. 833; (49) Can. 832.
 - culture—
 - and marketing, (46) 840.
 - at high altitudes, (44) Colo. 234.
 - biochemical problems in, (48) 637.
 - experiments, (41) N.Mex. 147, Can. 538, Nebr. 648; (42) Guam 37; (43) N.Mex. 339, Can. 741; (44) Alaska 336.
 - experiments in Philippines, (41) 650.
 - experiments in Nova Scotia, (41) 738.
 - in California, (46) 139.

Fruits—Continued.

- culture—continued.
 - in Canada, (46) 234.
 - in Mesopotamia, (45) 639.
 - in North Dakota, (41) N.Dak. 837.
 - in Queensland, (45) 44.
 - in Syria and Cilicia, (46) 339.
 - in the garden, (41) 97, 538; (44) Mo. 534.
 - in Tropics, (45) 439.
 - manuals, (41) 339, 340, 538, 650 on grassland, (43) 30.
 - progress in methods, (47) 339.
 - textbook, (50) 140.
- depth of planting studies, (46) Del. 640.
- detection of prior frozen condition, (44) 612.
- deterioration in transit, (43) 656.
- distribution and prices in Great Britain, (50) 293.
- dried—
 - energy value, (46) 859.
 - Indian, antiscorbutic value, (42) 163.
 - Indian meal moth on, (41) 665.
 - insects affecting, (47) Calif. 654.
 - insects affecting in California, (43) 255.
 - nomenclature, (43) Calif. 716.
 - process of treatment, (42) 804.
 - shipping temperature, (42) Calif. 833.
 - sterilization, (48) 554.
- driers for, construction, (42) U.S.D.A. 114.
- drying, (41) 557, 617, 618, 651, 807; (42) 616, Calif. 804; (43) Wash. 715; (44) Hawaii 15, Calif. 714; (45) 616, 720, Calif. 808; (48) Calif. 506, Calif. 507.
- drying for home use, (42) U.S.D.A. 114.
- drying, sun, in South Africa, (42) 115.
- drying, sun v. artificial heat, (48) 13.
- evaporation, (49) U.S.D.A. 411.
- evaporator for, description, (43) 808.
- export, causes of loss in shipments, (48) 741.
- export, cold storage conditions at Cape Town, (46) 652.
- fall v. spring planting, (41) Mo. 648; (48) West.Wash. 298.
- fertilizer experiments, (44) Oreg. 834; (47) 340; (49) 833.
- for canning, (43) Wash. 698.
- for dry farming, (41) Ariz. 29.
- for farm orchards, (42) U.S.D.A. 343.
- for Iowa, (43) 742.
- for Minnesota, (42) 637, Minn. 834.
- for Nebraska, list, (43) 240.
- for small farmers in California, (42) 593.
- for storage, time of harvesting, (49) Iowa 740.

Fruits—Continued.

- freeze injury in 1921, (46) 233.
- freezing temperatures, (48) U.S.D.A. 730.
- frost prevention, (42) 440; (44) S.C. 533.
- frost protection, (44) 535.
- frost resistance studies, (41) Mo. 648.
- frost service of Weather Bureau, (48) 808.
- fumigated, hydrocyanic acid absorbed by, (49) U.S.D.A. 456.
- grading and packing in Australia, (43) 836.
- grafting and budding, (41) Ohio 147.
- handling and drying, (49) Oreg. 742.
- hardiness problem, (45) 638.
- hardy, breeding, (44) 234, S.Dak. 638.
- hardy, breeding and selection, S.Dak. (41) 238; (42) 836.
- hardy, culture, treatise, (44) 41.
- hardy, in Great Britain, handbook, (45) 135.
- hardy, treatise, (48) 443.
- home storage, (46) 386.
- identification, graphic records for, (42) 534.
- importance as food, (47) 363; (49) 364.
- improvement, (45) 228.
- in West Virginia, Kentucky, and Tennessee, (50) U.S.D.A. 644.
- indigenous to Philippines, value, (46) 339.
- indoor and outdoor culture, (48) 736.
- industrial utilization, (47) 112.
- insects affecting, (41) 160; (43) 438; (44) 57, Kans. 249; (46) 656; (48) 152; (50) 153.
- insects affecting in Germany, (46) 458.
- insects affecting in Ontario, (42) 544.
- internal stomata in, (44) 729.
- irrigation, (41) 452.
- jellying, factors affecting, (48) Del. 612.
- jellying, rôle of acids in (49) Del. 9.
- keeping quality, factors affecting, (47) Wash.Col. 535.
- maintaining vigor in, (41) 340.
- manganese in, (47) 502.
- marketing, (41) 341, Ill. 834.
- monthly working calendar for, (43) 236.
- new, characteristics, (47) 340.
- new, description, (45) 741.
- new or noteworthy, (49) N.Y.State 338.
- of Australia, marketing, (47) 895.
- of North Dakota, native, (41) 836.
- official grades in Idaho, (47) 393.
- oil-producing, production and use, (42) 212.
- orchard, for Montana, (42) 138.
- orchard, for North Dakota, (42) U.S.D.A. 343.
- oriental, antiscorbutic vitamin in, (49) 563.

Fruits—Continued.

- parasitic diseases, in Washington, (49) 445.
- pectic substances of, (49) 48.
- pectin in, (44) 111.
- physiological diseases, (44) Oreg. 840.
- picking, handling, and exhibiting, (50) Mo. 238.
- planting, value, (50) West.Wash. 195.
- pollination, (42) Calif. 832; (45) 346.
- pollination by bees and insects, (50) 561.
- pome, susceptibility to Gymnosporangium, (42) 48.
- preparation, laboratory manual, (47) 696.
- preservation, (41) 506; (44) 663; (45) 665; (46) 840.
- preservation—
 - and use in the home, (42) 255; (43) Can. 316.
 - by freezing, (43) U.S.D.A. 794.
 - in transit and storage, bibliography, (47) U.S.D.A. 830.
 - manual, (43) 15.
 - studies at experiment stations, (46) 609.
 - with Boloform, (47) 750.
- preserved, acids of, (49) 112.
- prices, increase in retail over wholesale, (44) N.Dak. 360.
- production and trade, (49) 376.
- production in Australia, (43) 237.
- production, sodium nitrate as stimulant, (45) 439.
- production, treatise, (47) 237.
- propagated at Ottawa, list, (46) 443.
- receipts in Cincinnati, (43) U.S.D.A. 490.
- refrigeration, (41) 443; (43) 339.
- resistance to cold, (43) 438.
- retail sales, bushel weights for, (47) 393.
- ripening, (44) 443.
- sacking, effect on keeping quality, (47) 832.
- scoring exhibits in, (50) 195.
- setting, effect of defoliation, (45) Oreg. 237.
- setting, factors affecting, (45) 238.
- shipments, inspection, (45) 835.
- small—
 - containers for, (41) 443, N.Dak. 763.
 - culture, (43) 40; (44) Wash. 43, Can. 237; (45) Mo. 641.
 - culture and propagation, (45) Mo. 238.
 - culture in Quebec, (42) 238.
 - culture, treatise, (41) 739; (44) 41.
 - damage, (44) U.S.D.A. 118.
 - diseases and pests, (44) Can. 237; (45) Mo. 238.
 - diseases, notes, (49) Oreg. 546.
 - effect of temperature on wound-ing, (43) U.S.D.A. 39.

Fruits—Continued.

small—continued.

- fall work with, West.Wash., (47) 898; (50) 195.
 fertilizer experiments, (45) 641; (47) Ark. 740.
 for Missouri, (44) Mo. 536.
 for Montana, (42) 138.
 for North Dakota, (42) U.S.D.A. 343.
 fruit bud formation, (50) 37.
 insects affecting, (41) 160; (44) 653; (49) Oreg. 555.
 Mendelian studies, (45) Wash. 236.
 mosaic affecting, (49) Oreg. 755.
 new varieties, (43) 438.
 planting and care, (46) U.S.D.A. 537.
 production in United States, (46) 642.
 pruning, (48) Mich. 342.
 record form for field labor operations, (47) West.Wash. 491.
 selection of disease-free plants, (48) West.Wash. 498.
 spray schedule, (47) Ohio 140.
 variety tests, (43) Minn. 833; (45) 44; (46) Del. 639; (47) Miss. 831; (50) Can. 440.
 winter injury, (45) Wash. 451; (47) 249.
 sources of new varieties, (49) West. Wash. 395.
 spoiled and pickled, recipes, (47) 113.
 spoiled, feeding value, (42) 769.
 sprayed, poisons on, (47) U.S.D.A. 360.
 standard containers for, (41) 443; (44) 144; (45) U.S.D.A. 135.
 standard grades, determining, (47) 894.
 sterility in, experiment station research in, (49) 104.
 stone, bacterial gummosis of, (50) 750.
 stone, Cladosporium cross-inoculations, (50) 656.
 stone, diseases, (46) 453.
 stone, diseases in British Columbia, (50) 249.
 stone, spraying for brown rot, (50) 552.
 storage, (41) Ill. 834; (48) 188, 236; (49) 437.
 storage at freezing temperature, (44) Calif. 207.
 storage in winter, (46) Wash. 233.
 substitutes in Germany, (43) 204.
 subtropical, for Yuma Mesa, (42) Ariz. 341.
 thinning, (49) Calif. 235, 599.
 tissue breakdown in, (47) 248.
 training, manual, (41) 650.
 transportation rots, relation to spraying, (47) 152.
 treatment, (45) 454.

Fruits—Continued.

- tropical and semitropical, manual, (41) 341.
 tropical and subtropical, manual, (44) 837.
 tropical, notes, (49) Guam 435.
 tropical, preservation, (46) 114.
 varieties—
 for British Columbia, (41) 340.
 for Illinois, (43) 438.
 for Minnesota, (42) Minn. 736.
 for Newlands project, (44) U.S.D.A. 441.
 for Oklahoma, (44) 39.
 for Oregon, (41) 444.
 for South Africa, (41) 835.
 for Washington, (44) Wash. 536.
 for Wisconsin, (41) 835.
 for Wyoming, (42) 637.
 in Germany, (41) 340.
 new, (42) 39; (45) 135.
 variety tests, (43) Can. 741, Minn. 833; (44) Minn. 336, Minn. 739; (45) 44; (47) Minn. 338; (50) Can. 643.
 vitamin B in, (43) 765.
 vitamin C in, (47) 268.
 wholesale distribution, (48) 596.
 wild, of Germany, (41) 742.
 wild, of Philippines, (45) 821.
 Wilder medal recipients, (47) 340.
 winter injury, (41) 749; (48) Mo. 455.
 winter injury in 1919, (44) Oreg. 821.
 Frutilla culture, (48) 40.
 Fucha on cotton, notes, (42) 148.
 Fuchsia, cytology and genetics, (48) 27.
 Fuckelia botryoidea n.sp., description, (46) 243.
 Fucus—
 spp., evolution of chondriomes and plastids in, (44) 823; (45) 30.
 spores as affected by light, (44) 520.
 spores, establishment of polarity, (44) 728.
 Fuel—
 alcohol, for small engines, (44) 785.
 alcohol, new sources, (43) 617.
 characteristics, economy and detonation, (45) 392.
 combustion in internal-combustion engines, (44) 786.
 composition, experiments, (48) 89.
 consumption of tractors, (49) 792.
 consumption studies, (49) 888.
 dilution, effect on efficiency of lubricating oils, (47) 890.
 effect of compression on detonation, (50) 188.
 engine, gasoline v. benzol, (48) 785.
 for motor transport, (49) 185.
 from waste sulphite liquor, (42) 615.
 liquid, from tropical plants, (47) 207.
 low-grade, valve adjustments for in gas engines, (43) 483.
 of varied volatility for motor vehicles, tests, (49) 386.

Fuel—Continued.

- oils for use in pump irrigation, (45) Ariz. 80.
- preparation, hot-spot method, (47) 889.
- types and grades, effect, (48) 887.
- vaporization, (48) 785.
- waste of, in domestic heating, (42) 590.
- wood situation, (49) 239.

Fuels—

- blended motor, detonation characteristic, (47) 791.
- engine, acetone in, (49) 888.
- for tractor engines, manufacture and tests, (43) 389.
- motor, discussion, (43) 187.
- treatise, (47) 292.

Fuligo septica, notes, (45) 144.

Fuligulinae, status of, (41) 547.

Fuller's earth, activated, preparation, (47) 408.

Fumagine in cultivated trees, remedies (43) 346.

Fumago spp. on olives, (42) 645.

Fumaric acid, formation in sugar fermentation, (43) 15.

Fumigation—

- gas-tight tents for, (45) 359.
- in greenhouses, (46) 641; (47) N.J. 51, 847; (48) 851; (49) 758.
- of chrysanthemums, (43) U.S.D.A. 361.
- of citrus trees, (49) U.S.D.A. 849.
- requirements, uniformity for nursery stock, (49) 352.
- results, factors affecting, (43) 850.
- schedule for citrus trees, (42) 250.
- situation in California, (46) 52.
- studies, (42) 529, 649; (44) Ala.Col. 751; (47) Calif. 654.
- tents, treating for mildew, (48) Calif. 543.
- value of weather records for, (43) 319.
- with calcium cyanid, (49) 849.
- with hydrocyanic acid gas, (42) 242; (44) 754; (48) 152.
- with sulphur, (47) 156.

Functional adjuvant, use of term, (42) 164.

Fundulus heteroclitus, behavior on salt marshes, (44) 656.

Fungi—

- altitudinal relations, (41) 746.
- and galls in Poland, (46) 742.
- and green plants, parallels, (42) 433.
- and scale insects, simultaneous control, (47) 153.
- ants as agents in dissemination, (44) 856.
- as affected by formaldehyde vapor, (41) 154, 245.
- attacking paints, (46) N.J. 554.
- behavior in mixed cultures, (44) 27.
- cause of deterioration of sugar, (46) 206, 417, 418.

Fungi—Continued.

- causing diseases of economic plants, (49) 839.
- causing timber decay, (47) U.S.D.A. 451.
- cell regeneration, (41) 346.
- citric acid as source of carbon for, (50) 630.
- control, (46) 336.
- damping-off, control in coniferous nurseries, (43) 42; (50) Minn. 49.
- direct inoculation methods, (48) 241.
- edible, of Philippines, (48) 842.
- entomogenous, (46) 51.
- from spotted apples, diagnosis, (46) 242.
- germination and growth, (48) 844.
- gold absorption by, (41) 329.
- growth in soil, (48) 319.
- imperfecti, identification and classification, (45) Mich. 241.
- in soil, method of counting, (47) 620.
- in soil, method of demonstrating, (48) 421.
- in soils, activities, (50) 620.
- insect-destroying, (46) 51.
- leaf, in South Africa, (44) 642.
- list, (47) U.S.D.A. 148.
- Manitoba, preliminary list, (49) 645.
- metabolism in, (48) 825.
- mixed cultures, (42) 225.
- mold, effects of acids, (43) 523.
- mold, formation of soluble starches by, (43) 523.
- new, (43) 841.
- new color reactions for, (46) 724.
- new Japanese, (45) 427.
- nutritional physiology, (45) 732.
- of fruit rots, pycnidial forms, (49) 349.
- of Hawaii, (50) 727.
- of Japan, new, (41) 746.
- of New York, new, (41) 346.
- of Porto Rico, (41) 842.
- of stone fruit, temperature relations, (47) 151.
- on economic plants in Indo-China, (46) 741.
- on moldy grain, (43) 445.
- on roots of Epigaea, (50) 428.
- parasitic—
 - dissemination, (42) 45.
 - ecological conditions of development, (41) 245.
 - in Wisconsin, (42) 350; (49) 242.
 - new species, description, (42) 350.
 - of Java, (43) 841.
 - perennial mycelium, (46) 545.
 - physiological specialization, (41) 152.
 - suppression of molds during incubation, (47) 647.
 - temperature relations of growth, (49) 540.

Fungi—Continued.

- physiology of, (42) 224; (44) 26; (46) 324; (49) 26, 125.
 - polyporoid, insect enemies, (44) 57.
 - Porto Rican, new or noteworthy, (45) 338.
 - production of acid by, factors affecting, (48) 826.
 - research on, (50) 142.
 - respiration studies, (41) 524.
 - rust, culture studies, (45) 144.
 - sap stain, notes, (48) 649.
 - saprophytic, on diseased potatoes, (42) 726.
 - sexuality, production and orientation, (44) 819.
 - spores, germination in relation to H-ion concentration, (42) 225.
 - spores in the upper air, (49) 747.
 - sporulation by symbiosis in, (42) 131.
 - toxic effect of gases on, (44) U.S.D.A. 55.
 - toxicity of sulphur to, (47) N.H. 243.
 - tyrosin in, (42) 628.
 - volutin in, (50) 428.
 - wilt-producing, temperature relations of, (42) 845.
 - wood-destroying, (41) 453, 746.
 - wood-destroying—
 - effect of heat, (50) 754.
 - field cultures, (48) 549.
 - growth on liquid media, (44) 27.
 - in roofs, (44) 651.
 - little-known hosts, (48) 851.
 - spore germination, (44) 55.
 - toxicity of zinc chlorid to, (49) 447.
 - wood-staining, notes, (49) 250.
- Fungicide law, résumé, (48) 152.
- Fungicides—*see also* Sprays and specific kinds.
- action of, (45) 754.
 - addition of adhesives to, value, Wis. (49) 644, 645.
 - analyses, (43) N.J. 37, Me. 339; (44) N.J. 440; (45) N.Y.State 639; (46) Conn.State 522; (47) N.J. 140, Me. 441; (49) Conn.State 233, Me. 233, N.J. 233.
 - analysis, official method, (44) 9.
 - and insecticides, compatible combinations, (49) U.S.D.A. 448.
 - and periodic system, (45) 754.
 - as affected by rain, (45) 49.
 - based on copper, national problem, (47) 647.
 - commercial, value against mildew, (43) 549.
 - comparison, (46) 448.
 - composition and use, (46) Mass. 38.
 - copper, relative adhesiveness, (43) N.H. 842.
 - description, (42) 341.
 - dust, for smut control, (44) 343; (50) Calif. 43.
 - effect on plants, (43) N.H. 44.
 - effect on pollination, (47) 742.

Fungicides—Continued.

- effect on *Pseudomonas citri*, (45) 850.
 - effectiveness of copper in, (48) 148.
 - examination, optical methods, (47) 15.
 - for grapevines, (42) 353.
 - for treatment of seed potatoes, tests. (45) Idaho 241.
 - formulas, (45) 44; (47) Ohio 638.
 - inspection and analyses, (41) N.J. 43, N.Y.State 237, Mich. 443; (42) 137; (46) Mich. 444.
 - law in Maine, (43) Me. 339.
 - legislation in United States, (44) 801.
 - lime-sulphur, (49) 145.
 - new, (47) 749.
 - notes, (41) 354; (44) 56, 535.
 - orchard, (47) 152.
 - soil, effect on tobacco root rot, (43) 447.
 - studies, (47) 254.
 - summary, (50) 255.
 - tests, (44) Oreg. 840; (48) 50.
 - toxic action, N.H. (43) 44; (46) 343.
 - treatise, (49) 51.
 - use in Quebec, (43) 844.
 - use in South Africa, (43) 834.
- Fungus—
- and host plant, differential staining, (43) 444.
 - cultures, infestation by mites, (48) 461.
 - diseases for combating insect pests, (46) 457.
 - diseases of economic plants, control, (49) 540.
 - diseases of fruit and hops, (48) 152.
 - diseases of plants, recent literature, (47) 43.
 - diseases of sorghum millet, (47) 544.
 - diseases, treatise, (48) 749.
 - flora of cane sugar, (41) La. 416.
 - gnats, notes, (50) 255.
 - infections, relation of temperature and humidity, (42) 242.
 - insect fauna of moist woods, (48) 153.
 - insects and hosts, (45) 253.
 - insects, notes, (48) 158.
 - parasites of insects, (41) 59.
 - parasites of seeds, internal, (45) Md. 844.
 - pests in England and Wales, (48) 740.
 - spores, germination, (48) N.H. 544.
 - spores, longevity, (50) 630.
 - stains in green wood, (47) U.S.D.A. 755.
- Fur—
- Astrakhan, production in Canada, (43) 69.
 - farming industry in Wisconsin, (49) Wis. 675.
 - hairs, identification, (44) 467.
 - industry of Far Eastern Republic, (48) 576.
 - Persian lamb, production in Canada. (43) 69.
 - supply, maintenance, (44) U.S.D.A. 546.

Fur—Continued.

- tanning and dressing, (47) Calif. 578.
- trade and supply, (46) 655.

Fur-bearing animals—

- breeding, (48) 768.
- exhibition standards, (43) 575.
- laws, U.S.D.A. (42) 51; (44) 248; (46) 151; (48) 51; (50) 252.
- trapping, (46) 455.

Furcraea fibers, (41) 641.

Furfural—

- action on amino acids, (42) 210.
- determination by colorimetry, (48) 11.
- for seed disinfection, (47) 45.
- manufacture from corncobs, (43) 809; (46) 710; (49) 507; (50) 505, 806.
- preparation and uses, (45) 510.

Furnace—

- for decomposition of ammonia, description, (43) 220.
- heating, treatise, (50) 589.

Furnaces—

- pipeless, (44) U.S.D.A. 588.
- warm-air, heat emission from, (50) 589.
- warm-air, humidity conditions with, (49) 185.
- warm-air, studies, (49) 288.

Furniture beetles, life history and control, (44) 658.

Fusafine—

- for barley treatment, tests, (49) 840.
- for bean seed treatment, (49) 841.

Fusarium—

- acuminatum, utilization of glucose as source of carbon, (45) 354.
- affine on tobacco, (47) 545.
- and associated fungi in cereal diseases, (47) 647.
- annuum n.sp. description, (42) N.Mex. 844.
- annuum n.sp., notes, (43) N.Mex. 348.
- blight, epidemic, (44) 642.
- blight, studies, (47) 246.
- blights of potatoes in India, (50) 247.
- coeruleum, notes, (44) 447.
- conglutinans callistephi n.var., studies, (41) 846.

Gabi, culture directions, (45) 35.

Gadflies—see also *Tabanus* spp.

- of Mesopotamia, (44) 760.

Galactagogue, milk as, (41) 80.

Galactose—

- detection and identification, (47) 205.
- fermentation of, (43) 610.
- preparation, (46) 10, 308.

 α -D-Galaheptose, preparation from gulose, (42) 503.

Galanthus spp., new chromogen in, (43) 327.

Galeatus peckhami, life history, (50) 453.

Galenicals, standardization, (44) 111.

Galeruca xanthomelaena, see Elm leaf beetle.

Galerucella luteola, see Elm leaf beetle.

Galerucella 6-vittata, life history notes, (43) 850.

Galium spp., Peronosporas on, (43) 653.

Gall—

- flies, American, (45) 860; (48) 59.
- insects, notes, (41) 160.
- insects, Philippine, (42) 731.
- midges from India, (45) 857.
- midges, studies, (41) 160; (47) 550.
- mite, life history and control, paper on, (42) 152.
- wasps, descriptions, (48) 256.

Gal-lamziekte, cause of, (42) 477.

Galleria mellonella, see Bee moth and Wax moth.

Gallobellicus nicotianae, notes, (41) 354; (42) 155.

"Galloserin" for fowl cholera, (43) 586.

Galls—

- giant crown, of Florida Everglades, (43) 444.
- leafy crown, mechanism of formation, (43) 242.
- psyllid, bibliography of, (44) 353.
- vegetable, character and origin, (49) 45.

Galton, F., centenary appreciation, (48), 762.

Gamasoidea, new species, description, (44) 760.

Gambusia affinis—

- seasonal abundance, (45) 555.
- studies, (46) 157.
- value for mosquito control, (48) U.S.D.A. 155.

Game—

- as national resource, (47) U.S.D.A. 51.
- birds and wild fowl of British Islands, (50) 355.
- birds, breeding, (48) 851.
- cold storage, cooking, (44) 61.
- conservation laws of Maryland, (49) 250.
- in savage Sudan, (49) 847.
- inspection in Switzerland, (44) 148.
- law of Alaska, report, U.S.D.A. (43) 350; (45) 358; (47) 549; (48) 748.

laws in Massachusetts, (46) 694.

- laws, 1919-24, U.S.D.A. (41) 753; (44) 56; (46) 151; (48) 51; (50) 150.

- protection, directory of officials for, U.S.D.A. (42) 354; (44) 248; (46) 151; (48) 51; (50) 355.

Games for organized play, manual, (49) 297.

Gangrene, gas—

- and blackleg, relation between, (42) 380.

- antitoxin, standardization, (45) 781.
- bacteriological types, diagnosis, (44) 373.

- calcium-ion factor, (41) 83.

- incidence and histopathology, (45) 579.

- prophylaxis and treatment, (41) 576, 577.

- studies in France, (44) 373.

Ganoderma—

- applanatum, habits of, (43) 849.
- applanatum, notes, (49) 540.
- applanatura, notes, (49) 45.
- lucidans, notes, (48) 45.
- spp., notes, (46) 348; (47) 651.

Gapes in chickens, (41) W.Va. 88.

Gapes, transmission by earthworms, (43) Md. 586.

Gapeworms, infection and spread, (45) U.S.D.A. 78.

Garages, modern, plans, (42) 285.

Garages, plans, (43) 592.

Garbage—

- analyses, (44) U.S.D.A. 73.
- cantonment, for pigs, (43) Ky. 374.
- feeding, relation to hog cholera, (46) 874.
- feeding value, (41) Del. 177; (43) Okla. 70, Ariz. 772; (44) U.S.D.A. 73, Del. 366, N.J. 367; (49) Wyo. 470; (50) Miss. 69, Wyo. 371.
- tankage, availability of nitrogen in, (41) Ohio 517.
- v. rolled barley for pigs, (44) Ariz. 571.

Garbanza bean feed, analyses, (45) 872.

Garbanzos, yields, (41) Ariz. 331.

Garcinia mangostana, germination in, (44) 628.

Garden—

- competitions, (42) U.S.D.A. 346.
- crops, insects affecting, (49) N.Mex. 553.
- diseases, (42) 147, U.S.D.A. 341, 546, 796.
- diseases, suggestions for teachers, (42) U.S.D.A. 396.
- Florida tropical, notes, (48) 199.
- insects—*see also* Vegetables, insects affecting, *and special crops*.
- control, (42) U.S.D.A. 341, 796; (43) Wash. 496.
- descriptions, (41) 56.
- important, (48) 52.
- notes, (43) N.Mex. 352.
- of Boulder, Colorado, (41) 754.
- of Florida, (41) Fla. 455.
- of New York, (41) 160.
- suggestions for teachers, (42) U.S.D.A. 396.
- summary, (46) 153.
- treatise, (42) 546.

pests in New Zealand, (42) 533.

plats for Spanish schools, (47) 200.

Shakespearean, at Stratford-on-Avon, (42) 800.

soil, artificial heating, (48) 818.

work calendar, (43) 236; (44) 440, 534; (45) 43.

Gardening—*see also* School gardening and Vegetable gardening.

community, development, (42) 444, 738.

cooperative, (43) 644.

dictionary, Black's, (45) 43.

for service men, (43) 898.

Gardening—Continued.

for twentieth century, (49) 836.

home, (47) Colo. 139.

home, treatise, (48) 735.

in New Zealand, manual, (42) 533.

in Oregon, (46) Oreg. 838.

in South Africa, treatise, (48) 636.

instructions, (42) U.S.D.A. 299, 796; (46) U.S.D.A. 537.

lessons in, (46) 898.

ornamental—*see also* Landscape gardening.

color effects in, (41) 448.

manual, (47) 643.

principles, treatise, (46) 838.

teaching, guide for, (44) 794.

textbook, (41) 96, 298; (47) 195.

treatise, (41) 236, 339; (42) 444, 533;

(43) 697, 741, 833, 834; (45) 740,

741; (48) 635; (49) 836; (50)

139.

use of hotbed and coldframe in, (41) 538.

work in, (43) Wash. 496.

Gardens—*see also* School gardening and Vegetable gardening.

children's, in steel town, (45) 398.

construction, treatise, (49) 439.

fall work in, (44) Mich. 195.

form and design, treatise, (43) 236.

historic, of Virginia, (49) 836.

home, all-the-year, (43) Ariz. 741.

home, diseases and insects, (42) U.S. D.A. 341.

in Great Britain as affected by frosts of 1916-17, (41) 236.

of celebrities near London, (43) 342.

old country, of Switzerland, treatise, (50) 239.

popular discussion, (45) 344.

rock, and alpine plants, treatise, (48) 840.

rock, treatise, (45) 441.

southern, blossom circle of year, treatise, (47) 643.

variety in, treatise, (49) 836.

Gargaphia, synopsis of, (42) 154.

Gargaphia tiliae, notes, (41) 847.

Garget—*see also* Manmritis.

catarrhal, cause and treatment, (49) West.Wash. 884.

Garlic—

eradication from wheat, (47) Md. 436.

flavor in milk and cream, removal, (48) 176, 233.

juice, bactericidal power of, (42) 7.

wild, eradication, (48) 233.

Gas—

analysis apparatus, (44) 202.

as source of power in motor vehicles, (43) 86.

asphyxiating, effect on horses, (43) 82.

burette, description, (43) 611.

consumption of household range, (44) 664.

engines, *see* Engines, internal-combustion.

Gas—Continued.

- formation in condensed milk, (43) Iowa 76.
- fumigating, absorption by cheese, (47) Calif. 655.
- gangrene, *see* Gangrene.
- illuminating, abscission response to, (42) 333.
- illuminating, effect on plants, (42) 730; (44) 825.
- illuminating, insecticidal value, (44) U.S.D.A. 56.
- measurement in anaerobic culture, (48) 311.
- meter, laboratory, description, (46) 201.
- meters, calibration and use, (44) 202.
- mixtures, explosions of, (48) 589.
- plant waste water, fertilizing value, (46) 220.
- plants and engines, suction, (46) 585.
- produced during starch fermentation, (44) 309.
- producer, for tractors, (47) 90.
- production by carbonizing straw, (47) 391.
- sales, relation to home cooking, (49) 57.
- semirigid containers for, (43) 87.
- straw, distillation, (42) 685.
- water, fertilizing value, (49) 216.

Gas-electric generating plant for farm use, (44) 785.

Gaseous—

- detonation, laws governing, (49) 387.
- exchange in soils, mechanism, (50) 719.

Gases—

- for coloring citrus fruits, tests, (50) P.R. 540.
- industrial, treatise, (43) 627.
- military, action on plants, (45) 28, 29.
- poisonous, effect on elm, (46) 829.
- poisonous, effect on plants, (43) 523; (45) 125, 734; (46) 128, 738; (50) 428.
- poisonous, effect on trees, (45) 54.
- toxic, as treatment for peach tree borer, (42) 54.
- toxic, fumigating value, (44) U.S.D.A. 55.

Gasoline—

- analyses, (44) 586; (45) 392.
- and kerosene carburetion, experimental survey, (49) 85.
- automobile, treatise, (49) 85.
- carburetion, (44) 484.
- characteristics and economy, (45) 392.
- chemical properties, (43) 187.
- consumption on different road surfaces, (49) 687.
- consumption tests, (42) 483.
- inspection and analyses, (43) 187, 790.
- production and use, (43) 187.
- State taxation, (46) U.S.D.A. 86.
- substitutes, possibilities, (43) 187.
- survey, (44) 382.

Gasoline—Continued.

- treatise, (46) 87.
 - v. benzol as engine fuel, (48) 785.
 - volatility, changes in, effect on fuel consumption, (49) 887.
- Gasoline-kerosene mixtures, flash and burning points, (46) 490.
- Gasometric burette, new, description, (42) 109.
- Gasterocercodes gossypii, notes, (45) 554.
- Gastric—
- analysis, (45) 66, 262.
 - analysis—
 - abnormal residuum, (45) 666.
 - apparatus for, (42) 11.
 - equilibrium zone, (46) 666.
 - method, (44) 66.
 - Rehfuß fractional method, (46) 710.
 - Rehfuß method, error in, (47) 506.
 - contents, acidity, determination, (44) 505.
 - digestion during duodenal regurgitation, (47) 264.
 - juice, composition, (42) 553.
 - juice, psychic secretion, (44) 665.
 - residuum, studies, (41) 764.
 - response to foods, (41) 467, 857; (42) 861; (44) 664, 665.
 - secretion and alkaline tide, (49) 560.
 - secretion in health and disease, (49) 363.
- Gastritis—
- parasitic, in calves, (41) 479.
 - parasitic, in cattle, treatment, (49) 786.
 - parasitic, in lambs, (49) 283.
 - traumatic, in ruminants, (47) 80.
- Gastroenteritis, epidemic, from food poisoning, (42) 663.
- Gastroenterology, studies, (42) 465.
- Gastro-intestinal tract as affected by deficient diet, (43) 665.
- Gastrophilus—*see also* Bots.
- bots in colts, (48) N.Dak. 81.
 - equi, *see* Gastrophilus intestinalis.
 - intestinalis as affected by thymol, (46) 885.
 - larvae, intoxication by, (42) 75.
 - larvae, relation to equine infectious anemia, (44) 280.
 - spp. in South Africa, (41) 874; (42) 75.
 - spp., studies, (41) 480; (42) 381, 678; (46) 686.
- Gastrozonia japonica n.sp., description, (42) 653.
- Gates, form, plans, (42) 285.
- Gear wheels, treatise, (50) 687.
- Geel dikkop in sheep, (44) 76.
- Geese—
- digestion and nitrogen-balance trials, (46) 173.
 - feeding, (47) 377.
 - feeds and feeding, (41) Can. 370.

Geese—Continued.

- nematode parasite of, (44) 379.
- North American, life histories, (49) 756.
- raising, (42) 563; (45) 474; (47) N.J. 673.
- raising for feathers and skins, (49) 374.
- raising in Argentina, (49) 171.
- raising, treatise, (48) 768.
- respiration, (48) 680.
- respiration calorimeter experiments, (46) 172.
- wild, and foods of Bear River marshes, (45) U.S.D.A. 250.

Gelatin—

- absorption of moisture by, (45) 525.
- acidity of, (43) 801.
- analyses, (43) Conn.State 859.
- and glue, chemistry of, treatise, (48) 207.
- and glue industry, treatise, (45) 318.
- ash, arsenic, copper, and zinc in, (50) 712.
- chemistry and technology, (49) 206.
- colloid chemistry, (41) 801.
- constitution and properties, (44) 503.
- detection in meat extract, (46) 13.
- edible, industrial fellowship for research on, (48) 300.
- for ice cream, determining quality, (49) 377.
- gels, evidence of structure in, (47) 608.
- gold number determination, (43) 12.
- good and bad, (48) 773.
- grades for ice cream making, (47) Okla. 878.
- hydrolysis products, (44) 710.
- imbibition, studies, (41) 221.
- in ice cream, determination, (49) 13.
- jelly strength, (44) 613.
- jelly strength test for judging, (49) 879.
- jellying power, determination, (44) 313.
- liquefaction as affected by H-ion concentration, (41) 11.
- liquefaction by bacteria, (50) 526.
- method of purifying, (45) 506.
- mutarotation of, significance, (44) 313.
- pepsin digestion of, (42) 165.
- preparation in the home, (42) 255.
- properties, variation in, (48) Calif. 577.
- quality, (50) 180.
- quality, effect on viscosity and melting resistance of ice cream, (49) 177.
- utilization as source of nitrogen, (47) 563.
- zinc content, (41) 464.

Gelechia—

- gossypiella, *see* Cotton bollworm, pink.
- neotrophella n.sp., description, (45) 156.
- ocellatella, notes, (41) 460.

Gelechia—Continued.

- operculella, *see* Potato tuber worm.
- trialbamaculella, control, (50) Mass 659.
- Gelignite, use for land clearing, (42) 183.
- Gelis microplitidis n.sp., description, (48) 59.
- Generic types, regulations for fixing, (42) 128.
- Genes, arrangement, linear theory of, (50) 129, 730.
- Genes, Mendelian, function, (49) 266.
- Genetic—
 - differences, analysis, (49) 567.
 - experimentation, (44) 428.
 - experiments of Carnegie Institution, (47) 569.
 - experiments with guinea pigs and rats, (49) 864.
 - form and nomenclature, (45) 167.
 - formula for calculating number of individuals to obtain a given frequency, (49) 462.
 - segregation, (47) 221.
 - terms, discussion, (50) 729.
- Genetical Society of Great Britain, formation, (42) 98.
- Genetics—*see also* Heredity and Hybridization.
 - and adaptation, (49) 567.
 - and eugenics, treatise, (47) 67.
 - and evolution in plants, (44) 631.
 - and pathology, relation, (50) 328.
 - application to control of plant disease, (42) 144.
 - Department of Carnegie Institution, work, (49) 24.
 - development, (48) 661.
 - Doncaster's contributions to, (45) 369.
 - elementary course in, (47) 799.
 - handbook, (48) 165.
 - method of diallel crossing, (43) 866.
 - of flower coloration in *Tropaeolum majus*, (43) 328.
 - of flower form and color, (44) 428.
 - papers on, (48) 398.
 - place in agricultural curriculum, (44) 400.
 - principles, (50) 527.
 - section, establishment in Experiment Station Record, (50) 6.
 - textbook, (48) 564.
 - theory, and problem of embryonic development, (50) 527.
 - treatise, (42) 865; (48) 468.
- Geobotany of Santa Lucia Mountains, (41) 220.
- Geobotany, research methods in, (50) 21.
- Geochemistry, data, (43) 419.
- Geodetical tables, (41) 808.
- Geography—
 - business, treatise, (48) 193.
 - commercial, textbook, (42) 898; (46) 895.
 - courses in Texas, (43) 598.

Geography—Continued.

- economic, of new states of Europe, (47) 297.
- economic, treatise, (46) 295.
- home, for rural schools, (47) 299.
- lesson plans on wheat, (47) 397.
- political, new world problems in, (46) 697.

Geological Survey, *see* United States Geological Survey.

Geologists, field handbook, (48) 16.

Geology—

- agricultural, treatise, (43) 719.
- and water resources of Sacramento Valley, (49) 587.
- comprehensive, treatise, (49) 510.
- engineering, treatise, (45) 889.
- for agricultural schools, (44) 494.

Geometrid, corn-feeding, notes, (49) 154.

Georgia—

- Coastal Plain Station, notes, (42) 197.
- Coastal Plain Station, report, (48) 193, 693.
- College, notes, (41) 898; (43) 497, 599; (44) 395; (47) 398, 800; (49) 98.
- Station, notes, (41) 199, 398, 496, 898; (42) 398; (44) 298; (45) 199; (47) 197; (48) 600.
- Station, report, (41) 198; (43) 197; (45) 94; (47) 496; (49) 598.

Geotrichum candidum on Brie cheese, (42) 877.

Geotropic—

- and phototropic stimuli, path of transmission in oats, (48) 728.
- response, changes during, (44) 323.
- stimulation in plants, (41) 725.

Geotropism—

- and mobile starch, (50) 127.
- horizontal, (48) 223.
- studies, (45) 629; (50) 225.
- theory, (46) 527, 528; (47) 327; (49) 219.

Geraniol in apples, (48) 607.

Geranium—

- bacterial leaf spot, (49) 250.
- leaf spot, transmission, (45) Md. 451.
- sibiricum, control, (44) Pa. 737.

Geranomyia canadensis, life history, (46) 460.

Geratoteleia marlatti, parasitism by, (44) S.Dak. 652.

Germ cells—

- in mammals as affected by alcohol, (41) 863.
- origin, in vertebrates, (44) 173.

German Society of Food Chemists, (49) 608.

Germination—*see also* Seeds and various crops.

- biology of, (49) 232.
- electro-physiological processes in, (48) 827.

Geum root rot, (46) 544.

Ghee—

- and butter, comparison, (47) 582.
- corn oil as substitute, (43) 563.

Ghee—Continued.

- making and use in India, (42) 563.
- making in India, (46) 276.
- standard for, (45) 277.
- vitamin A in, (47) 661.

Giardia intestinalis, notes, (49) 477.

Giardia spp., differentiation, (47) 681.

Giardias in man and animals, (47) 885.

Giardiasis, human, supposed rodent origin, critique, (47) 681.

Gibberella—

gossypina, notes, (45) 649.

saubinetii—

- description, (49) 445.
- Fusarium affecting, (49) 840.
- in seed corn, (49) 243.
- life history, (44) 243.
- notes, (41) 544; (42) 644; (44) Conn.State 150, 541, 642, 644; (48) 242, Mo. 644; (49) Ind. 538, Ky. 541.
- on corn, (46) Del. 239, 547.
- production of conidia in, (43) 545.
- relation to H-ion concentration, (46) Mo. 343; (50) 44.
- studies, (43) Mo. 749; (46) U.S. D.A. 240; (47) 246; (48) Mo. 643.

Gibellinia cerealis, notes, (49) 45.

Gid in sheep, occurrence, (44) 184.

Gigantism as affected by length of day, (42) 818.

Gilia tricolor, new disease of, (43) 544.

Gillettea cooleyi, life history, (50) 556.

Ginger—

- disease, new, (49) 147.
- disease, notes, (43) 445; (44) 446.
- fungus attacking, (44) 150.
- Pythium disease, notes, (45) 647.
- soft rot, notes, (43) 652.

Ginkgo, evolution of vacuolar system in, (44) 822.

Ginseng culture, (45) U.S.D.A. 140.

Ginseng, Ramularia root rots, (41) 155.

Gipsy moth—

- blood cytology, (44) 758.
- caterpillars, effect of inanition, (50) 452.
- control, (41) Conn.State 158; (43) Mass. 159; (45) 758; (47) Conn. State 155; (49) U.S.D.A. 852; (50) Conn.State 50, 257.
- eggs, hatching, effect of low temperature, (48) U.S.D.A. 54.
- in New Jersey, (45) 255; (47) 552; (49) 355; (50) 257.
- insect enemies, (43) 252.
- intersexuality in, (50) 226, 430.
- menace in New York State, (50) 155.
- notes, (43) Conn.State 251; (44) 351; (48) U.S.D.A. 52, N.J. 353.
- on cranberries, (45) 551; (47) Mass. 452; (48) U.S.D.A. 253.
- parasite of, U.S.D.A. (41) 461; (47) 57.
- parasites, distribution, (46) 457.
- pseudograsserie, (41) 357.

Gipsy moth—Continued.

- quarantine, (49) Conn.State 655.
- resistance to *Bacillus hoplosternus*, (42) 153.
- spraying experiments, (44) 252.
- suppressing, (45) Conn.State 148.
- tree banding material, U.S.D.A. (44) 455; (49) 253.
- westward spread, (48) 854.

Girdle worm on cranberries, (42) 442.

Girls—

- agricultural competitions, prizes for, (41) 495.
- basal metabolism of, (49) 457.
- clothing club, sewing handbook, (47) 598.
- clothing contest, plans, (43) 495.
- club leadership, course of study for, (43) 796.
- clubs, (45) Guam 94; (46) Guam 793; (50) 298.
- clubs—

- bread making manual for, (47) Ill. 696.
- factors in efficiency, (45) 496.
- 4-H, in West Virginia, (47) 496.
- history of, (44) 461.
- in Canada, (43) 796.
- in Iowa, organization, (49) 96.
- in Kansas, (46) 194.
- in New Zealand, (46) 793.
- in Northern and Western States, U.S.D.A. (42) 598; (49) 394.
- in United States, (43) 195.
- organization, (45) U.S.D.A. 197; (49) Alaska 491.
- projects, (49) 297.
- relation of nature study to, (42) 795.
- relation to rural homes, (46) 598.
- results, U.S.D.A. (45) 197, 798.
- sewing, instructions for, (42) U.S.D.A. 196.
- status and results, (46) U.S.D.A. 393.

- energy requirements, (47) 364.
- metabolism, (43) 167.
- pig clubs, (47) 76.
- vocational education for, (43) 197; (45) 94.

Gizzard, function of, (49) 71.

Glacial drift—

- as liming material for peat soils, (43) 631.

- soils, studies, (44) 123; (45) 19.

Gladioli—

- for Mississippi, (44) 147.
- propagation experiments, (44) 238.
- varieties, (42) 43.

Gladiolus—

- bacterial disease, (45) 752.
- Fusarium* rot, notes, (50) 753.
- seed, germination tests, (43) 240.

Glanders—see also Mallein.

- antibodies, hereditary transmission, (42) 777.

Glanders—Continued.

- bacillus, culture media for, (44) 478.
- blood tests, interference by lid test, (45) 481.
- complement fixation tests for, (42) 379, 380.
- control, (43) 272, 277; (45) 786, 881; (48) 81; (49) 179.
- control in Massachusetts, (46) 681.
- diagnosis, (41) 84, 477; (42) 272; (43) 277, 278, 471, 583, 685, 881; (44) 278, 579; (45) 786; (47) 385.
- diagnosis—

- conglutination and KH reactions for, (48) 776.

- differential, (42) 75.

- in slaughtered animals, (44) 478.

- methylene blue test, (45) 683.

- polyvalent extracts for, (43) 181.

- reliability of precipitation test, (45) 76.

- serological tests for, (44) 779.

- value of complement fixation test, (44) 76.

- effect on mallein test, (47) 681.

- equine and human, relation, (42) 677.

- human, serum therapy, (50) 480.

- immunization, (42) 380, 778; (46) 485.

- in Canada, (47) 181.

- in Germany, (45) 786.

- in Great Britain, (46) 178; (50) 182.

- in India, control, (47) 878.

- in mules, (41) 784.

- infected animals, use of hides and meat from, (44) 478.

- intrapalpebral test for, (45) 181.

- lid test, value, (46) 278.

- notes, (41) 189, 280, 873; (44) 180; (46) 773; (49) 278; (50) 582.

- prophylaxis and treatment, (41) 576.

- summary, (46) 580.

- tests, comparison, (45) 481.

- white blood picture in, (44) 679.

- Glands of internal secretion in polyneuritis, (50) 265.

Glass—

- chemistry of, progress, (41) 613.

- containers, material dissolved from, (48) 711.

- platinized, substitute for platinum, (43) 612.

- Glasson, E. J., biographical sketch, (44) 398.

- Glassware, H-ion concentration, (48) Mich. 204.

- Gleditsia, thick-walled root hairs, (46) 631.

Gliadin—

- amid nitrogen in, (44) 308.

- duplicate analyses, (45) 614.

- effect on blood regeneration, (44) 565.

- effect on growth, (49) 360.

- hydrolysis products, (50) 8.

- rate of hydrolysis, (48) 202.

- Gliocladium viride, notes, (41) 844.

- Glinicidia prunings, fertilizing value, (41) 528.

Globin, isoelectric point of, (48) 802.

Globulin—

crystalline, of cantaloupe seed, (49) 714.

in blood serum, determination, (48) 9.

in maple seed, (46) N.Y.State 308.

of cohune palm nut, analyses, (45) 9.

α and β , of Georgia velvet beans, (43) 410.

of wheat bran, analyses, (50) 711.

Gloeodes, new genus, erection, (46) 552.

Gloeodes pomigena n.comb., (46) 552.

Gloeosporium—

ampelophagum, notes, (45) 54, 451; (46) 543.

aridum, notes, (44) Conn.State 149.

carthami n.comb., notes, (46) 239.

caulivorum, notes, (42) N.Y.State 350; (44) 733.

coffeanum, notes, (46) 647; (47) 839.

fructigenum, notes, (43) 155.

fructus psidii, notes, (45) 647, 648.

laeticolor, varietal resistance of peach to, (46) 243.

limetticolum, notes, (44) 750; (45) 751.

lindemuthianum, notes, (43) 546; (45) 50; (49) 841.

musarum on banana, (46) 845.

n.spp., description, (46) 239.

nervisequum, notes, (41) 353; (43) 754.

on peppers, (43) 45; (45) Ga. 47.

on walnut, (49) 847.

papayae, notes, (46) 454.

piperatum and Colletotrichum nigrum, (44) 445.

piperatum, conidial forms and synonymy, (45) 444.

ribis, studies, (45) 753.

sp. in oak, (47) 541.

sp., notes, (47) Fla. 650, 754; (49) 548.

sp. on rubber, (43) 45.

spp., notes, (42) 49, 741; (43) 544; (45) 649, 653, 842; (46) 451.

theobromicolum n.sp. on cacao, (42) 46.

tremellinum n.sp., description, (46) 829.

ulmicolum n.sp., description, (48) 850.

venetum, notes, (46) 143.

Gloeosporiums—

Japanese, morphology and physiology, (46) 239.

of oak and sycamore, (45) 753.

Gloiopeltis furcata, mucilaginous substance of, (44) 202.

Glomerella—

cingulata, conidial forms and synonymy, (45) 444.

cingulata, notes, (44) 445; (45) N.C. 443, 654; (46) 148; (47) 754.

cingulata vaccinii, notes, (43) Mass. 155.

Glomerella—Continued.

cingulata vaccinii on cranberries, (44)

Mass. 848; (45) U.S.D.A. 54.

gossypii, notes, (43) 243.

lindemuthianum, notes, (48) 741.

rufomaculans, notes, (46) 451.

spp., notes, (46) 845.

Gloomy scale, studies, N.C. (41) 660; (47) 851.

Glove making around Oxford, (46) 788.

Glucokinin, new hormone in plant tissue, (50) 108, 765.

Gluconic acid, preparation, (41) 619.

Glucose—

absorption as affected by light, (42) 227.

absorption by aerial parts of the mulberry, (41) 818.

decolorization with kelpchar, (47) 411.

determination, (43) 114; (45) 12.

determination—

effect of soluble calcium salts, (49) 112.

in presence of other sugars, (50) 614.

in vegetables, (44) 713.

use of iodine in, (48) 414.

effect on biochemical activities of *Bacillus botulinus*, (50) 785.

effect on blood sugar content, (50) 164.

effect on carbohydrate metabolism, (42) 557.

fermentation, (43) 610.

fermentation products, (48) 108.

from Arum, (41) 117.

H-ion concentration, for intravenous medication, (47) 203.

in corn, (45) 416.

in fruit juices, formulas, (47) 808.

in muscles of animals on different diets, (49) 570.

in sweet potato as source of carbon for fungi, (45) 354, 355.

intravenous, tolerance of dogs, (44) 65.

judging from pH value, (48) 415.

reactions in animal body, (50) 361.

sirup manufacture, (44) 807.

utilization by *Aspergillus niger*, (50) 125.

Glucosid, new, preparation and properties, (42) 728.

Glucosids—

and carbohydrates, treatise, (43) 410.

in *Digitalis*, development, (42) 227.

in plants, physiological rôle, (42) 226.

Glue—

and gelatin, chemistry of, treatise, (48) 207.

and gelatin industry, treatise, (45) 318.

and glue handling, (48) 612.

chemistry and technology, (49) 206.

feed, composition and digestibility, (43) 267.

Glue—Continued.

- jelly strength, (44) 613.
- jellying power, determination, (44) 313.
- water-resistant, manufacture, (42) 507.
- Glues, constitution and properties, (44) 503.
- Glumes of grasses in the upper air, (49) 747.
- Glutamin in human organism, synthesis, (47) 563.
- Glutathione, constitution, (50) 308.
- Glutathione, properties, (48) 311; (50) 461.
- Glutelin, composition, (49) 714.
- Gluten—
 - colloid chemistry, (41) 801.
 - determination in flour, (41) 803.
 - feed, analyses, (42) N.H. 769; (43) Vt. 464; (45) N.Y.State 469; (47) Mass. 274, Conn.State 570, N.J. 570, R.I. 571; (48) 68, Me. 68.
 - feed, composition and retail price, (47) Conn.State 570.
 - feed, digestibility, (50) Mass. 168.
 - feed, feeding value, (41) 569; (47) 782.
 - feed protein, utilization by dairy cows, (43) S.Dak. 873.
 - feed v. buckwheat middlings, (47) Pa. 478.
 - in Italian pastes, changes in manufacture, (42) 162.
 - meal, analyses, (47) Mass. 274, N.J. 570, R.I. 571; (48) Me. 68.
 - meal, composition and retail price, (47) Conn.State 570.
 - meal, feeding value, (48) Mo. 666.
- Glutenin—
 - effect on hydration capacity of flour, (50) 504.
 - viscosity and loaf volume of flour, (50) 504.
- Glutens, imbibitional properties, (50) 502.
- Glyceria grandis, analyses, (41) Wyo. 333.
- Glycerids of fats and oils, (47) 802.
- Glycerids of goose fat, (47) 10.
- Glycerin—
 - jelly slides, pests feeding on, (48) 153.
 - production from sugar, (41) 507.
- Glycerol—
 - in presence of sugar, determination, (47) 206.
 - nitric esters of, absorption spectra, (43) 801.
- Glycerophosphoric acid, ionization constants, (46) 413.
- Glycin—
 - effect on carbon dioxid-combining power of blood plasma, (47) 64.
 - effect on starch hydrolysis, (46) 707.
 - synthesis from formaldehyde, (48) 411.
- Glycinin, amino acids of, (45) 713.
- Glyciphagus cadaverum, notes, (41) 463; (48) 462.

- Glyciphagus fuscus in stored grain, (41) 851.
- Glycobius speciosus, notes, (50) Conn.State 50.
- Glycocoll in human organism, synthesis, (47) 563.
- Glycocoll production, (42) 821.
- Glycogen—
 - and avitaminosis, (50) 163.
 - determination, (42) 803.
 - in chick embryos, (42) 669.
 - in muscles of animals on different diets, (49) 570.
 - in tissues, effect of insulin, (50) 260.
- Glycolysis—
 - and insulin, (50) 461.
 - in diabetic and normal blood, (50) 569.
- Glycosuria, observations on, (41) 364.
- Glyoxalase content of liver in avian beri-beri, (45) 868.
- Glyoxylic acid, new color test for, (45) 110.
- Glypta mutica n.sp., description, (42) 655.
- Glyptotermes pubescens n.sp., notes, (49) 550.
- Gmelina arborea, notes, (42) 142.
- Gnathosotomidae, revision, (44) 684.
- Gnats, black flies, simulia, paper on, (48) 252.
- Gnats, fungus, of Canary Islands, (43) 661.
- Gnetum sp. for rope making, test, (42) 782.
- Gnomonia—
 - erythrostoma, notes, (43) 246; (44) 346.
 - iliau, notes, (43) La. 348; (46) 45.
 - ulmea, notes, (48) 850.
 - veneta, notes, (41) 752; (43) 652, 754.
- Gnomoniopsis piperata, conidial forms and synonymy, (45) 444.
- Gnorimoschema—
 - gallaesolidaginis, biology, (48) 159.
 - heliopa, notes, (45) 551.
- Goat—
 - butter, digestibility, (41) U.S.D.A. 65.
 - diseases, (44) 776.
 - manure, use, (49) N.Mex. 517.
 - meat in sausage, analyses, (42) 552.
 - meat, production in United States, (41) U.S.D.A. 892.
 - pox, infection resembling, (41) 578.
- Goats—
 - Angora, as scrub exterminators, (47) 72.
 - Angora, history and management, (46) U.S.D.A. 478.
 - body development, (50) 574.
 - breeding in Catalonia, (47) 866.
 - breeding in North Africa, (42) 560.
 - breeds in Porto Rico, (47) 173.
 - care in health and disease, (49) 377.
 - creatin excretion, (41) 672.
 - digestion trials with paper pulp, (45) 170.
 - distribution in South America, (46) 269.

Goats—Continued.

- eruptive disease of, (48) 86.
 - feed requirements, (48) 668.
 - feeding experiments, (48) 375.
 - hair structure, (44) 467.
 - home doctoring, (47) 483.
 - horn transmission, (49) Idaho 268.
 - inbreeding experiments, (44) 870.
 - indirect calorimetry with, (50) 266.
 - insect pests, (45) 552.
 - international trade, (46) 675.
 - investigations, (46) 766.
 - lactating, calcium balance experiments, (46) 74.
 - mammary secretion, studies, (41) 79.
 - metabolism, (45) 471; (47) Wis. 479.
 - milch, breeding, (47) N.Mex. 480.
 - milch, management and breeding, (46) 879.
 - milch, use in dairying, (41) 184; (42) 564.
 - milk, *see* Milk, goats'.
 - new oestrid parasite of, (48) 485.
 - of the Mediterranean, (47) 375.
 - ovarian grafts in, (47) 573.
 - ovarian testes in, (47) 275.
 - parasites of, (45) Tex. 483; (47) 883.
 - physiology of lactation in, (50) 266.
 - raising, (42) 265, 561.
 - raising in British Columbia, (45) 472.
 - raising in China, (43) 171.
 - raising in England, (47) 866.
 - raising on ranges, (41) U.S.D.A. 71.
 - raising, treatise, (44) 776.
 - stomach worms of, control, (49) Tex. 481.
 - twin, abnormal sex characters, (42) 561.
 - wasting disease, (43) Mich. 688.
- Goatskins—
- exports from South Africa, (41) 772.
 - trade in India, (44) 573.
- Godetia spp. and hybrids, (47) 822.
- Godetia spp., genetic studies, (45) 643.
- Goes tessellatus, studies, (50) 662.
- Goiter—
- genesis, relation to fats, (50) 668, 865.
 - in calves, (44) Wash. 780.
 - in calves and sheep, iodine for, (49) Wis. 681.
 - in goats, control, (49) Mont. 178.
 - in lambs, prevention, (50) Can. 371.
 - in pigs, remedy, (46) Mont. 374.
 - prevention, (43) Wash. 384, Wash. 784; (49) 769.
 - studies, (44) Wash. 479.
- Goldenrod—
- gall-maker, biology, (48) 159.
 - rayless, poisonous to livestock, (45) Ariz. 479.
- Gomontia lignicola n.sp., notes, (41) 429.
- Gomphocerus sibiricus, control in Russia, (49) 450.
- Gonad extracts, sex-specific effect, (46) 572.

Gonads—

- physiological properties, (42) 767.
 - senile, rejuvenation, (45) 771.
 - transplantation, effects, (46) 266.
- Gonatopus ombrodes, notes, (44) 167.
- Gongylonema—
- ransomi from pigs, (48) 778.
 - ransomi n.sp., description, (47) 588.
 - scutatum in sheep, (46) 885.
- Gonia capitata, parasitism by, (46) 247.
- Goniozus claripennis, biology, (50) 561.
- Gonocephalum—
- seriatum, parasitized by Epyris extraneus, (43) 662.
 - sp., notes, (43) 456; (45) 551.
 - spp. in Mysore, (41) 165.
- Gonoderma fulvellum, notes, (50) 42.
- Gonyglossum wiedemanni, notes, (47) 658.
- Goodyera repens, biology, (47) 426.
- Goose and duck hybrid, characters, (47) 570.
- Goose fat, glycerids in, (47) 10, 802.
- Gooseberries—
- breeding experiments, (43) 742; (44) 145; (46) 39; (47) Minn. 338; (50) Can. 339.
 - culture, (41) Mich. 148; (43) Nebr. 644; (44) Mont. 337, Alaska 532; (47) Minn. 338, Wis. 438, Alaska 534; (48) Minn. 338; (49) Mont. 136.
 - culture—
 - and marketing, (43) 40.
 - and propagation, (45) Mo. 238.
 - and quarantine regulations, (41) U.S.D.A. 45.
 - at high altitudes, (44) Colo. 235.
 - experiments, (44) Alaska 336; (47) Okla. 830; (49) Alaska 435.
 - description and yield, (48) Can. 38.
 - diseases and pests, (45) Mo. 238.
 - eradication by chemicals, (43) 246, 248.
 - fertilizer experiments, (45) 641; (47) 343.
 - hardiness studies, (45) N.Dak. 236.
 - identity of Cronartium on, (47) 355.
 - insects affecting, (43) Wash. 349; (44) Mo. 754; (46) 243; (49) Oreg. 555.
 - new varieties, (42) 637.
 - pectin content, factors affecting, (46) 207.
 - potash fertilizers for, (41) Mass. 21.
 - pot-grown, fertilizer experiments, (49) 833.
 - preserving, (45) 665.
 - pruning, (45) 44; (48) Mich. 342.
 - root and top growth, (47) 343.
 - spraying schedule, (44) Mo. 535.
 - storage studies, (46) 338.
 - storage temperature, (47) Calif. 640.
 - time of fruit bud differentiation, (49) 834.
 - varieties, (48) N.Dak. 235.

Gooseberries—Continued.

- varieties, classification, (49) 834.
- varieties for Missouri, (44) Mo. 536.
- variety tests, (41) 445; (42) Minn. 834.

Gooseberry—

- and black currant hybrids, (49) 436.
- anthracnose, control, (49) Oreg. 547.
- aphid, Houghton, studies, (42) 750.
- aphids in South Dakota, (43) 850.
- aphids, life history and control, (44) U.S.D.A. 59.
- borer, black, notes, (44) Oreg. 850.
- die-back, notes, (43) 246; (44) 346; (49) Oreg. 547.
- disease, new, (47) 546.
- diseases, (46) 243, 646.
- diseases and pests, (45) 551.
- diseases, control, (43) Wash. 349, Ill. 847.
- mildew, notes, (41) 49, 154, 751; (43) 246; (44) 346, Oreg. 839; (45) 48; (46) 448, 741; (47) 650, 749; (50) 353.
- powdery mildew, control, (49) Oreg. 547.
- roots, resistance to freezing, (44) N.Y.Cornell 821.
- silver-leaf, notes, (49) 845.
- witches' broom, notes, (41) Mich. 660; (48) Del. 635.
- worms in South Dakota, (43) 850.
- Gopher, pocket, control, (47) Calif. 549; (50) Minn. 153.
- Gophers, control, (46) 151, 455; (50) 454.
- Gortyna immanis, studies, (41) N.Y.Cornell 160.
- Gortyna micacea, notes, (45) 759.
- Gossyparia spuria, *see* Elm scale, European.
- Gossypol—
 - effect on digestion of cottonseed globulin, (50) 360.
 - in cottonseed products, (43) N.C. 411.
 - in cottonseed, variation and relation to oil in, (50) 111.
 - pharmacological action, (42) 175.
 - physiological effect, (50) 680.
- Gouda cheese from pasteurized milk, (47) 80.
- Gourd, Siam, value as human food, (45) 135.
- Graafian follicle of the sow, musculature, (46) 483.
- Gracilaria—
 - perseae, notes, (47) U.S.D.A. 157.
 - perseae on avocado, (44) 163.
 - soyella, parasite of, (47) 358.
 - sp., notes, (43) 851.
 - theivora on tea, (47) 658.
- Graft hybrids, infection studies, (43) 544.
- Graft of spruce on pine, anatomy, (41) 47.
- Grafting—
 - bridge, instructions, (50) U.S.D.A. 643.
 - in India, manual, (49) 741.
 - natural, of branches and roots, (41) 522.

Grafting—Continued.

- new method, (50) 543.
- symbiomorphoses arising from, (41) 522.
- wax, preparation, (46) Hawaii 640.
- waxes, comparison, (50) Can. 36.
- Grain—*see also* Cereals, Oats, Rye, Wheat, *etc.*
 - Act, Canada, amendments, (46) 694.
 - Act, Canada, analysis, (45) 89.
 - adulteration, relation to Food and Drugs Act, (46) 228.
 - amount for cows, (48) Can. 876.
 - and forage, amount for work animals, (46) Ill. 678.
 - and Hay Show, 1922 International, (49) Mich. 97.
 - aphid, control, (50) Mo. 51.
 - aphid, European, studies, (41) N.J. 253, N.Y.Cornell 849; (49) Iowa 757.
 - aphid, spring—
 - control, (49) Okla. 450.
 - life history and control, (42) 851.
 - method of study, (46) 245.
 - notes, (43) 556; (48) U.S.D.A. 52, 650.
 - on coffee, fungus enemies, (41) 59.
 - on cotton, (41) 251.
 - summary, (45) U.S.D.A. 553.
 - as sole diet, effects, (44) 68.
 - beetles in Australian wheat, (41) 759.
 - binder, power-distribution tests, (42) 892.
 - bins, circular concrete, loading test, (42) 787.
 - bins, design, (42) 187; (45) 792.
 - borer, lesser, notes, (41) 759.
 - borer, lesser, summary, (47) U.S.D.A. 156.
 - bug, studies, (41) U.S.D.A. 355.
 - coarse, for human food, (43) Can. 366.
 - commission merchants, (42) 392.
 - Corporation and guaranteed wheat prices, (43) 895.
 - cost of hauling by truck, (44) 887.
 - cost of marketing, (48) 390.
 - cost of production, (45) 190.
 - crops, effect of phosphatic fertilizers, (49) 726.
 - crops in Ontario, (41) 227.
 - crops, rotation experiments, (47) Minn. 130.
 - crops, statistics, (48) U.S.D.A. 294.
 - crops, value of research on, (46) 29.
 - crops, yield in Greece, (47) 121.
 - cultivated fallow for, (41) 738.
 - culture, (45) Miss. 37.
 - culture experiments, (41) Nebr. 36, Nebr. 638; (44) N.Dak. 88.
 - culture experiments in Wyoming, (41) 528.
 - culture in Canada, preparing land for, (42) 230.
 - culture in rows, (48) 334.

Grain—Continued.

- culture on corn land and fallow, (50) Mont. 134.
- culture on moor soils, (41) 786.
- culture under dry farming, (45) U.S.D.A. 531.
- culture under irrigation, (43) U.S.D.A. 637.
- damp, treatment, (45) 437.
- determination of specific weight, (45) 344.
- diseases in Holland, (45) 842.
- diseases, studies, (41) 655; (44) 642.
- dried, analyses, (43) R.I. 672; (44) Mass. 671.
- drills, tests, (42) 185.
- dust explosions and fires, prevention, (42) 284.
- ear deformation in, cause, (49) 246.
- effect of early seeding, (43) Wyo. 134.
- effect of fallowing, (48) Calif. 527; (49) Nebr. 527.
- elevator companies, cooperative, (43) U.S.D.A. 895.
- elevators—
 - accounting, (42) U.S.D.A. 392.
 - concrete, design, (45) 792.
 - cost of operation, (49) Kans. 489.
 - country, form for report, (42) 88.
 - dust explosions, (44) 587.
 - farmers', in Iowa, (49) Iowa 293.
 - fire prevention, handbook, (47) 689.
 - for South Africa, (44) 489.
 - lighting, (48) 786.
 - plans, (42) 787.
 - pneumatic, (46) 689.
 - types, (49) 293.
- Exchange of Winnipeg, report, (47) 296; (50) 891.
- exchanges, "hedging" in futures, (42) 290.
- exchanges, modern, (42) 392.
- experiments in Africa, (46) 227.
- extracts, acidimetric titration in presence of alcohol, (41) 113.
- fall seeded, soil management, (47) Mich. 814.
- fall v. spring plowing, (44) N.Dak. 125.
- farm organization, Wash.Col. (47) 594; (49) 291.
- farming, effect of capital on, (44) Mo. 788.
- fertilization of soils for, (45) Mich. 815.
- food from, treatise, (42) 456.
- for pigs on forage, amount, (46) Ohio 368.
- formaldehyde treated, effect on fowl, (49) 377.
- frost injury, (41) 335.
- future trading in, (46) 291.
- Futures Act, 1922, (50) U.S.D.A. 293.
- germination, effect of carbon dioxide, (46) 323.

Grain—Continued.

- germination, effect of dead leaves in rain water, (46) 813.
- grading, undergraduate course in, (44) 697.
- grinders, tests, (49) 486.
- grown in combination, (48) 436.
- handling, bulk, (48) U.S.D.A. 294.
- handling equipment, development, (48) 198.
- handling in France in eighteenth century, regulation, (49) 91.
- handling, treatise, (49) 293.
- hay mixtures under irrigation, (47) Mont. 130.
- hulls, composition and digestibility as affected by sodium hydrate, (49) 167.
- insects affecting, (44) 653.
- inspection, (41) Mont. 39.
- inspection in United States, (44) 143.
- Inspection Laboratory, Montana, work, Mont. (44) 143; (48) 735; (49) 231.
- irrigation experiments, (42) 576.
- judging for boys' and girls' clubs, (46) 296.
- lodging of, (45) Ohio 127.
- market as affected by car shortage, (43) U.S.D.A. 595.
- marketing, (47) 296, 895.
- marketing, cooperative, (45) U.S.D.A. 88.
- marketing, cooperative, in Russia, (42) 791.
- marketing, country, (46) 290.
- marketing plan, (45) 595.
- marketing, proposed improvement in Argentina, (42) 593.
- markets, terminal, (46) 291.
- mixture, feeding value, (47) Wyo. 171.
- moisture as factor in grading, (44) 527.
- moth, parasite of, (49) 256.
- newly harvested, germination tests, (44) 233.
- official grades in Idaho, (47) 393.
- pests, effect of chloropicrin, (45) 455.
- pests in England, (42) 545.
- pests in New York, (41) 160.
- pests, parasites of, (46) 558.
- pests, sulphur dioxide for, (47) 156.
- pressure in storage bins, (42) U.S.D.A. 187.
- production in Italy, (45) 192.
- production in western Canada, (45) 737.
- proteins, supplementary value, (46) 161.
- purchasing power, (49) Nebr. 292.
- retail prices in India, (42) 393.
- rotation experiments, (49) Oreg. 526.
- rusts in South Dakota, (43) 546.
- rusts, notes, (41) 655.
- rusts of Oregon, (41) 152.
- sacks, sewing, (50) Calif. 190.

Grain—Continued.

- salvaged, feeding value, (46) 674.
- sampling device, (43) U.S.D.A. 642.
- sampling, sources of error in, (48) 436.
- seed, impurities, (49) 736.
- seed, treatment, (45) 49.
- seeding, measuring delivery rate with drill, (50) 230.
- separator, power-distribution tests, (42) 892.
- separators, fire and dust-explosion prevention in, (41) 691.
- situation in southeastern Europe, (43) U.S.D.A. 695.
- small, culture experiments, (43) Wash. 738.
- small, effect on following crop, (49) Nebr. 732.
- small, harvesting and threshing, (43) U.S.D.A. 637.
- smuts—*see also* Cereal smuts, Smut, and specific grains.
 - control, (43) 244; (44) Oreg. 841; (49) 645.
 - germination, relation to H-ion concentration, (46) Mo. 344.
 - studies, (41) Mo. 654.
- spring, comparison, (49) Pa. 223.
- standardization, (45) 595.
- standards, Federal, relation to farmer, (44) 143.
- statistics during the war, (44) 694.
- statistics in Scotland, (41) 795.
- statistics in United States, (41) 492; (45) 898; (47) 597.
- stem rust, dissemination, (42) Wis. 350, 742.
- stem rust in Wisconsin, studies, (42) 742.
- storage, (49) 153.
- storage, treatise, (44) 787.
- stored, acarids of, (44) 851.
- stored, destruction by *Trogoderma khapra*, (47) 258.
- stored, insects affecting, (41) N.J., 58, 456, 463, 549; (42) 153, 551; (43) 252, 253, 254; (44) 754; (45) 359, 552, 657; (47) Nebr. 156, U.S.D.A. 156, 254, Ohio 359.
- stored, treatment with chloropicrin, (49) 455.
- supervision, Federal, (41) U.S.D.A. 636.
- supply, future, of Austria-Hungary, (43) 393.
- test weight per bushel, (47) U.S.D.A. 436.
- thrips, notes, (47) 551.
- trade, Canadian, yearbook, (50) 693.
- trade, government monopoly in Germany, (42) 189.
- trade, internal, of United States, (50) 690.
- trade of Canada, (46) 496; (47) 493.
- trade of United States, 1850-1860, (44) 387.

Grain—Continued.

- trade of Yugoslavia, (48) 529.
 - trade, outline of policies, (41) 388.
 - trade regulations, (47) 94.
 - transpiration of in relation to light, (43) 131.
 - varieties, (50) West.Wash. 134.
 - varieties for Canada, (47) 823.
 - varieties, susceptibility to Hessian fly injury, (41) Kans. 34.
 - variety tests, (50) Pa. 432.
 - variety tests, cooperative overstate, (49) Mich. 97.
 - vitamin content as affected by soil fertility, (46) 624.
 - warehouses, regulations, U.S.D.A. (41) 891; (43) 896.
 - water requirement as affected by environment, (41) 631.
 - weevil, broad-nosed, affecting corn, (44) 760.
 - weevil, broad-nosed, life history and habits, (48) 58.
 - whole, as poultry feed, (43) N.Mex. 378.
 - whole v. crushed, for pigs, (50) Can. 370.
 - winter, conversion into spring, (42) 530.
 - with pasture, value for cows, (49) Oreg. 578.
 - yields, effect of continuous culture, (48) N.Dak. 20.
- Gram—
- culture experiments, (42) 132; (44) 527, 632; (45) 35; (46) 437, 634.
 - culture in Burma, (41) 529.
 - fertilizer experiments, (42) 132; (44) 632; (45) 35; (46) 437, 634.
 - irrigation experiments, (46) 634.
 - plant, effect of waterings on acids, (45) 526.
 - rotation experiments, (44) 632; (45) 35; (46) 437.
 - stain, modification, (45) 779; (46) 431.
 - staining, methods, (49) N.Y.State 731.
 - variety tests, (42) 132; (44) 632; (45) 35; (46) 437, 634.
- Grams, analyses, (44) Ariz. 568.
- Gram grass range, maintenance, (47) U.S.D.A. 468.
- Graminaceae roots, reducing activity of, (44) 426.
- Gramineae important for food and fodder, (41) 720.
- Granary, portable, (43) 892.
- Granary weevil—
- affecting stored corn, (44) 760.
 - as affected by air-tight storage, (43) 254.
 - control, (45) 656; (49) Mont. 251.
 - notes, (41) 758; (43) 450.
 - paper on, (43) 51.
 - parasite of, (49) 256.
 - reputed vesicating properties, (47) 259.

Granary weevil—Continued.

- summary, (47) U.S.D.A. 156.
 - supposed poisonous qualities, (47) 659.
 - transmission from infested wheat to macaroni, (50) Minn. 152.
 - vitality and rate of increase, (43) 254.
- Grange, work of, treatise, (46) 695.
- Granite block, tests, (45) U.S.D.A. 488.
- Granite paving block, modified abrasion test, (43) 85.
- Granulomata in southern Australia, studies, (46) 184.

Grape—

- anthracnose, notes, (41) 349; (42) 49, 746; (43) 244; (45) 54, 451.
- aphids, life history and control, (44) U.S.D.A. 59.
- baskets, standard size, (44) 144.
- beverage, preparation, (49) Calif. 412.
- bird's-eye disease, notes, (42) 741.
- black measles, notes, (49) Calif. 248.
- black rot as affected by dry weather, (43) 652.
- black rot, notes, (41) 49, 54, 751.
- black rot, treatment, (43) 657.
- black spot, notes, (41) 349; (47) 250.
- brunissure, brown corpuscles of, (48) 456.
- California disease, (42) 49.
- chlorosis, (46) 745.
- chlorosis, breeding for resistance, (41) 740.
- chlorosis, treatment, (42) 746.
- cluster disease, studies, (49) 547.
- Cochylis, control, (41) 836.
- court-noué and vitamins, (48) 147.
- court-noué, nature of, (48) 147.
- court-noué, studies, (41) 845; (42) 353; (46) 745.
- cuttings, one-eye, (46) 338.
- cuttings resistant to drying, (47) 833.
- disease, nonparasitic, (47) N.Mex. 444.
- diseases, (44) 642; (45) 444, 653; (46) 745; (47) 546.
- diseases, control, (41) 54; (43) Ill. 847.
- diseases in Cuba, (42) 49.
- diseases in Germany, control, (42) 238.
- downy mildew—
 - control, (42) 151; (43) 657; (45) 147; (46) 453; (47) 153, 250.
 - control in India, (42) 146.
 - factors affecting, (43) 657.
 - in Algeria, (46) 745.
 - in Australia, (46) 849; (48) 50
 - in South America, (42) 151.
 - new remedies, (46) 745.
 - notes, (44) 48, 649; (45) 147.
 - spore germination in, (48) 148.
 - sprays for, (48) 148.
 - studies, (41) 54, 249, 349, 751, 845.
- flea-beetle, control, (45) 852.
- growing, commercial, (45) Ark. 347.

Grape—Continued.

- industry, banking system for, (47) 192.
- industry in California in 1919, (43) 837.
- industry in California, status, (46) 40; (48) 40.
- industry in Chautauqua-Erie grape belt, (42) N.Y.Cornell 442.
- insects, notes, (50) N.Y.State 555.
- juice, analyses, (48) Calif. 506.
- juice, canning, (44) 534.
- juice, clarification, (46) U.S.D.A. 617.
- juice, desiccated, antiscorbutic value, (46) 359.
- juice factories, utilization of waste, (45) U.S.D.A. 209.
- juice manufacture, (41) U.S.D.A. 806; (42) Ohio 615, Calif. 805; (44) S.C. 461; (45) 210.
- juice, methyl anthranilate, in (45) 207; (46) 207; (48) 413; (50) 205.
- juice preserves, manufacture in Asia Minor, (42) 417.
- juice, recipes, (47) 113.
- juice, unfermented, manufacture, (43) Calif. 717.
- juice, vitamin B in, (43) 765.
- leaf curl, control, (49) 144.
- leaf sun scald, notes, (45) 843.
- leafhopper—
 - control, (45) 757; (46) 852; (47) 54; (49) 654.
 - effect on sugar in grapes, (49) 850.
 - new, description, (47) 850.
 - notes, (41) 848; (48) Mich. 251; (49) 848; (50) 755.
- leaves, ring spot disease, (47) 749.
- mare as coffee substitute, (42) 415.
- marc, utilization, (46) 509.
- mealybug, control, (42) 649; (48) 152.
- mealybug, present status, (48) 553.
- mildew, false, control, (49) 144.
- mildew, notes, (41) 740, 836; (42) 741.
- mildew, powdery, (45) 850.
- mildew, spore germination in, (50) 249.
- mildew, treatment, (46) 48.
- oidium, control, (41) 845; (42) 151; (43) 244, 657; (44) 649, 848; (46) 448; (47) 749.
- Peronospora, control, (44) 849; (50) 149.
- pests, control, (48) 539.
- phylloxera, *see* Phylloxera.
- pigments, studies, (50) N.Y.State 410.
- pyralid, parasites of, (50) 561.
- root knot nematode, control, (50) 451.
- root weevil, biology and control, (49) 50.
- roots, disinfection, for winter eggs of phylloxera, (49) 655.

Grape—Continued.

- roots, resistance to freezing, (44) N.Y.Cornell 821.
 - rootworm, remedies, (41) N.Y.State 852.
 - rot, control, (43) 657; (46) 543.
 - rot, notes, (48) Ariz. 449.
 - scale in California, notes, (43) 256.
 - seed, commercial utilization, (42) 212.
 - seed meal, analyses, (44) Calif. 768.
 - seed oil, composition, (46) 613.
 - seeds, viability, (47) 834.
 - sirup, manufacture, (42) 805; (43) Calif. 716; (44) S.C. 461; (47) Calif. 614; (48) Calif. 507.
 - sphinx moth, studies, (43) 453.
 - stocks, drought resistance of, (43) 40.
 - stocks for heavy calcareous soils, (47) 344.
 - stocks, notes, (44) Calif. 833; (46) 642.
 - stocks, phylloxera - resistant, Calif. (42) 833; (46) 540; (47) 640.
 - stocks, transmission of fasciation and dichotomy, (45) 32.
 - vinegar, manufacture, (44) 714.
 - water berries, notes, (49) Calif. 248.
- Grape-berry moth—
- control, (43) U.S.D.A. 454; (47) 55; (49) Mich. 53.
 - life history, (44) U.S.D.A. 457.
 - notes, (45) Conn.State 149.
 - summary, (48) Mich. 651.
- Grapefruit—
- as budding stock, (41) 447.
 - black spot, notes, (42) 643.
 - bud selection, (44) P.R. 442.
 - canker, relation to stomata structure, (47) 546.
 - chemical changes during ripening, (42) 42.
 - coloration, factors in, (41) Fla. 539.
 - composition, changes in, (48) 329.
 - culture, (44) V.I. 339; (45) 347; (49) Tex. 436.
 - culture in Belgian Kongo, (45) 347.
 - disease, new, (48) 746.
 - diseases, notes, (47) 838; (50) P.R. 547.
 - fertilizer experiments, (45) P.R. 638.
 - from Isle of Pines, diseases, (50) 752.
 - from Porto Rico, standards, (47) 834.
 - fulgorid leafhopper affecting, (43) 556.
 - in storage, changes, (44) 639.
 - juice, clarification, (46) U.S.D.A. 617.
 - juice, desiccated, antiscorbutic value, (46) 359.
 - juice, manufacture, (48) U.S.D.A. 13.
 - juice, vitamins A and B in, (43) 765.
 - leaves, analyses, (44) 544.
 - leaves, injection pressure, relation to canker resistance, (48) 745.
 - new fungi on, (42) 353.
 - peel, candied, recipe, (48) U.S.D.A. 13.
 - peel, jellied, (46) 258.
 - Phomopsis on Isle of Pines, (50) 752.

Grapefruit—Continued.

- pink-fleshed, origin, (43) 440; (46) 339.
 - pruned v. unpruned, (43) 439.
 - pruning, (49) Calif. 641.
 - ripening and storage, (46) 339.
 - spraying experiments, (43) 157.
 - stem-end rot, notes, (48) P.R. 247.
 - thrips, notes, (44) P.R. 453.
 - tissue breakdown in, (47) 248.
 - trees, large-sized nursery, value, (48) Calif. 533.
 - trees, variability in size and production, (42) 140.
 - variety tests, (44) Calif. 737.
 - vitamin A in, (50) 59.
 - vitamin C in, (49) 563.
- Grapes—see also Vineyards.
- American, culture experiments in India, (46) 735.
 - American, European ancestry, (48) 538.
 - American, market position, (43) U.S.D.A. 694.
 - animal parasites of, (43) 657.
 - antiscorbutic value, (41) 861.
 - as affected by chloropicrin, (45) 28.
 - as affected by potassium, (50) 644.
 - breeding experiments, (41) Ga. 145, N.C. 650, N.C. 739; (42) S.Dak. 836; (43) Md. 143; (44) S.C. 533; (45) 837; (49) 437; (50) 238, 299.
 - breeding, inheritance of anatomical characters, (50) N.C. 131.
 - Concord, fruiting habit, (49) 237.
 - Concord, variations during ripening, (48) 803.
 - copper fungicides for, (43) 155.
 - cost of production, N.Y.State (45) 642, 643.
 - culture, (41) 339, 446, 740; (45) 44; (46) Mo. 140, Calif. 540; (47) Miss. 40; (49) Mich. 236, Oreg. 535; (50) West.Wash. 598, S.C. 642, Mo. 836.
 - culture—
 - and arsenicals, paper on, (49) 50.
 - and marketing, (43) 40.
 - and rainfall deficiency, correlation, (49) 808.
 - experiments, (41) N.J. 41, 836; (42) 736; (43) 40; (48) U.S.D.A. 235, Hawaii 338.
 - experiments in Arizona, (50) U.S.D.A. 138.
 - handbook, (42) 41.
 - in Argentina, (44) 536.
 - in Arizona, (49) Ariz. 641.
 - in France, (45) 742.
 - in Greece, (46) 642.
 - in Michigan, (49) Mich. 495.
 - in Morocco, (43) 835.
 - in Quebec, (42) 238.
 - currant, stocks for, (42) Calif. 833.
 - drying, (45) 720, Calif. 808.
 - drying, factors affecting, (43) Calif. 715.

Grapes—Continued.

eastern, marketing, (43) U.S.D.A. 836.
 effect of stocks on quality and yield, (44) 146.
 evaporation, (44) Calif. 738.
 exported from South Africa, (48) 40.
 fertilization and management, (48) 838.
 fertilizer experiments, (41) N.Y.State 341; (42) 222, 536; (44) N.Y.State 534; (45) 346; (47) Ark. 740; (48) 737; (50) N.Y.State 539.
 fertilizing methods, (44) 43.
 for Yuma Mesa, (42) Ariz. 341.
 Franco-American hybrids, (43) 239.
 fresh, conservation, (42) 737.
 fruiting habit, (47) 344.
 fungi affecting, (42) 41.
 girdling experiments, Calif. (42) 833; (44) 738.
 grafting experiments, (49) Tex. 435.
 grafting, methods, (42) 639.
 grafting, "Yema" method, (42) 41; (45) 139.
 hardiness in, (46) Tex. 335; (48) 233.
 hardy variety, (48) Del. 635.
 hybrid, direct-bearing, (41) 241, 446, 740; (43) 239, 745.
 improvement in Germany, (46) 40.
 increasing yields, (46) 842.
 insect and fungus enemies, (46) U.S.D.A. 235.
 insects affecting, (42) 41; (44) Mo. 754; (50) 659.
 insects affecting in Germany, (42) 238.
 irrigation, (46) Calif. 40.
 Isabella, jellifying properties, (49) Hawaii 411.
 lightning and smoke injury, (44) Conn.State 150.
 liming experiments, (47) 324.
 Madaleine Angevine, (49) 140.
 magnesium for, (42) 737.
 muscadine—
 breeding experiments, (43) Ga. 147.
 culture, (44) S.C. 443.
 improvement and use, (46) 40.
 new varieties, (43) Ga. 148.
 products and use, (44) S.C. 461.
 variety tests, (46) S.C. 733.
 must analyses, (41) 836.
 new or noteworthy, (49) N.Y.State 338.
 new parasite of, (44) 649.
 nutritional requirements, seasonal changes, (50) 742.
 Ohanez, culture experiments, (42) 41.
 planting and disbudding dates, (46) 736.
 pollination as affected by rain, (47) 742.
 production and distribution, (46) Iowa 736.
 production in Spain, (42) 140, 737.
 propagation, (44) Calif. 639.

Grapes—Continued.

protection from spring frosts, (43) 40.
 pruning, (41) 241, 836; (46) Calif. 540; (50) 300.
 pruning—
 and training, (43) Md. 143.
 cordon system, Calif. (46) 540; (47) 640.
 errors in, (48) Calif. 40.
 experiments, (43) N.Y.State 341; (47) Ark. 740; (48) 737; (50) N.Y.State 539.
 in New South Wales, (45) 742.
 instructions, (45) 44.
 systems, (47) Md. 235; Calif. 537; (50) Can. 339.
 wounds, covering, (44) S.C. 532.
 raisin, sulphuring, (41) Calif. 15.
 root formation and development, (43) 836.
 sap acidity, relation to disease resistance, (41) 740, 844.
 seed chalcid attacking, (50) 851.
 spray residue on, (47) U.S.D.A. 360.
 spray schedule, (42) Ark. 736; (44) Mo. 535; (47) N.J. 140, Ohio 140; (49) N.J. 138.
 spraying experiments, (41) 349, 751; (43) U.S.D.A. 843.
 sugar content as affected by leafhopper injury, (49) 850.
 thysanopterous pest, (41) 455.
 training, (45) 347.
 training, effect on fruit production, (48) Md. 538.
 types of flowers and intersexes in, (45) N.Y.State 439.
 varieties, (41) 844; (45) Okla. 438; (47) Calif. 640; (48) Can. 38, N.Dak. 235.
 varieties—
 at San Antonio, (47) U.S.D.A. 438.
 for calcareous soil, (43) 745.
 for juice, (42) Ohio 615.
 for Missouri, (44) Mo. 536.
 in Valencia, (49) 237.
 new, (43) 438; (45) 140.
 root systems, (49) 41.
 variety tests, (42) Calif. 833, Minn. 834; (43) U.S.D.A. 144; (45) Ala.Col. 139; (46) Hawaii 640, S.C. 733; (47) Minn. 338.
 vinifera, training, (49) N.Mex. 532.
 wild, northern and southern strains, tests in Minnesota, (41) 144.
 wine, drying, (41) 651.
 wine, future use for, (42) 537.
 winter injury, (44) Conn.State 150.
 yield per vine, (47) Okla. 831.
 Grapevine—
 apoplexy, treatment, (49) 649.
 cochylis, control, (42) 156.
 disease, notes, (47) 839; (49) 45.
 flea-beetles, life history, (44) U.S.D.A. 459.
 looper, studies, (44) U.S.D.A. 455.

Grapevine—Continued.

- mealybug, oviposition, (47) 551.
- Otiiorhynchus, studies, (41) 59.
- pyralid, remedies, (41) 59.
- shoot silage as source of alcohol and tartaric acid, (41) 618.
- shoots, use in livestock feeding, (48) 568.

Grapevines—

- biology, (47) 250.
- death or wilting of, (47) 49.
- frosted, treatment, (46) 642.
- fungicides for, (42) 353.
- gummosis in, treatment, (42) 151.
- injury by freeze and hail, (46) 745.
- recovery from spring frosts, (49) 140.
- replacing missing, (48) Calif. 40.

Graphidium strigosum, ensheathed larvae, (47) 252.

Graphiola coccoina, notes, (47) 547.

Graphiola phoenicis, notes, (45) 653, 843; (46) 647.

Graphite, use as solid lubricant, (49) 888.

Graphium penicillioides, notes, (49) 250.

Graphium sp., notes, (47) 547.

Graptolitha dorsana injury, prevention, (47) 551.

Graptolitha spp., studies, (41) 357.

Grass—

and bone meal, efficiency in calcium equilibrium, (50) 678.

and clover mixtures, tests, (45) Can. 824.

as farm crop in Texas, (42) 291.

as silage crop, (42) Wash. 828.

Australian water, as feed, (44) Hawaii 30.

Bahia, culture experiments, (43) 528.

Bermuda, variety tests, (43) U.S.D.A. 330.

buffalo, dioecious nature, (43) 522.

creeping bent, vegetative planting, (49) 635.

disease and botulism, (47) 186.

effect on orchard yield, (44) 41.

fertilizer experiments, (44) Del. 431.

for seed, fertilizer experiments, (41) 228.

fruits, normal and abnormal germination, (45) Me. 27.

grub, New Zealand, control, (45) 459.

loss in preserving, (50) 866.

Mexican, history of, (44) 26.

mixtures—

as pasture for dairy cows, U.S.D.A. (43) 468; (44) 775.

comparative yields, (43) Idaho 738.

drilling v. broadcasting, (41) 230.

experiments in Finland, (50) 533.

for lawns, inspection, (41) N.J. 40.

for pastures, (49) Pa. 223.

for seeding waste land, (41) 231.

on grasslands and pastures, (46) 131.

Grass—Continued.

mixtures—continued.

on peat soils, (42) 733.

tests, (41) 229; (44) 434.

pest, new, in Queensland, (46) 559.

pests in New York, (41) 160.

phosphates for, (41) 426.

production in France, treatise, (42) 437.

roads, injury from mole crickets, (43) 53.

root beetle in Australia, (41) 666.

rotation experiments, (44) Del. 431.

rusts, comparison, (43) 244.

rusts of Andes, (45) 844.

seed, chaff in, (44) 233.

seed, depth of sowing, (47) 829.

seed identification, (44) 143.

seed, methods of covering, (50) 34.

seed testing, method, (43) 44.

seed tests, (44) 143.

seedlings, effect of previous crops, (49) Can. 734.

seeds, infestation of skin of sheep by, (43) 184.

seeds, iron and manganese content, (49) 202.

seeds, newly harvested, germination, (44) 233.

seeds, production in England, (45) 637.

situation on coastal plain in South-east, (42) 303.

smuts, control, (42) 47.

stored, electrical preservation, (47) 32.

stripe rust, notes, (44) Oreg. 842.

take-all disease, (50) 549.

uptake of nutrients and storage, (50) 333.

Grasses—see also Meadows, Pastures, and specific kinds.

absorption of water and nitrates, (49) 29.

agricultural, persistence, (49) Can. 734.

American, axillary cleistogenes, (41) 635.

analyses, (41) Wyo. 333; (44) Ariz. 568; (45) 775; (50) Oreg. 7.

and forage plants, (47) Calif. 630.

as affected by ammonium sulphate, (47) Mass. 218.

as forage crops in Denmark, (43) 177.

as paper making material, (43) 317.

as silage crop, (50) Alaska 532.

Australian, nutritive value, (50) 168.

breeding experiments, (45) 523, 734; (48) P.R. 227; (49) Fla. 824.

breeding methods, (44) 827.

breeding, principles, (46) 129.

culture, (42) Calif. 823; (43) Idaho 738; (44) Alaska 423; Guam 633;

(45) Guam 34.

culture—

and use in Australia, (47) 227.

Grasses—Continued.

culture—continued.

- experiments, (41) Can. 528; (43) 824; (44) Oreg. 826; (45) Kans. 83, Ariz. 429, 532; (46) Guam 725; (47) Alaska 527; (48) Can. 31, Ariz. 434; (49) 329, Tex. 429, Mont. 430; (50) S.C. 637.
- experiments in Iceland, (48) 32.
- in Malaya, (48) 732.
- on peat soil, (43) 23.
- daylight germination of seeds, (50) 34.
- distribution in grazing areas of United States, (41) 471.
- early growth in alkali soil, (42) Utah 28.
- effect on fruit trees, (43) 29, 237.
- effect on soil acidity, (47) 723.
- effect on soil nitrate content, (41) Mo. 623.
- effect on tree growth, (47) Tex. 439.
- ergot on, specialization, (48) 432.
- fall seeding, (43) Wash. 738.
- feeding value, (47) Calif. 668.
- fertilizer experiments, (42) Va. 21, N.Y. State 326; (46) Mass. 19; (47) Wash. 124, 226.
- first book of, (48) 395.
- for lawns in South China, (43) 441.
- for livestock feed, (46) Hawaii 633.
- forest, of India, (41) 522.
- from different altitudes, nitrogen content, (41) Wyo. 333.
- from South America, new species, (50) 735.
- genera of, descriptions and keys, (42) U.S.D.A. 828.
- green, efficiency in calcium equilibrium, (50) 678.
- hay and pasture, varieties, (41) 334.
- important cultivated, (47) U.S.D.A. 333.
- indigenous, germination, (47) 829.
- insects in, relation to crops, (46) 457.
- introduced, studies, (46) Guam 440.
- lawn and pasture, studies, (49) Fla. 823.
- lawn, susceptibility to *Rhizoctonia*, (42) 243.
- Linnaean genera of, (43) 729.
- manual, (44) 827.
- meadow, on swamp lands, (43) Oreg. 21.
- microscopic identification, (46) 531.
- mosaic disease of sugar cane on, (49) 647.
- native, for hay and silage, (41) Alaska 30.
- native, of India, comparisons, (50) 28.
- native, value for hay and silage, (49) Alaska 426.
- new, notes, (41) Fla. 528.
- newly introduced, behavior and adaptation, (49) Fla. 824.
- North American revision, (43) 522; (44) 327.

Grasses—Continued.

- notes, (48) Hawaii 330, Calif. 528.
 - of Argentina, (48) 831.
 - of Arizona, (47) 333.
 - of British Guiana, (48) 33.
 - of Florida, (46) 30.
 - of Great Britain, (44) 633.
 - of Mexico, (41) 821.
 - of New South Wales, (46) 638.
 - of South Africa, (41) 529.
 - of South India, handbook, (48) 130.
 - pasture, culture experiments, (48) Ga. Coastal Plain 128.
 - pasture, effect of grazing, (49) U.S.D.A. 866.
 - pasture, tests, (42) U.S.D.A. 370.
 - pasture, useful, (50) 434.
 - range, carrying capacity, (48) N.Dak. 69.
 - range, of North Dakota, (41) 434.
 - root development as affected by water level, (43) 623.
 - seed, germination tests, (49) U.S.D.A. 866.
 - seeding tests, (50) N.Y. Cornell 230.
 - Septoria diseases of, (50) 648.
 - slime molds on, (45) 144.
 - take-all disease, (50) 746.
 - tests, (49) Oreg. 525.
 - top-dressing experiments, (47) Del. 433.
 - varieties, (49) Mont. 130.
 - varieties, characteristics, (50) 237.
 - variety tests, (43) Can. 735; (44) Mont. 331, V.I. 332, Calif. 731; (45) Ariz. 429, Can. 822; (46) Hawaii 633; (48) Can. 227, Ariz. 434; (49) Idaho 732.
 - viviparousness in, (45) 123.
 - water requirements, (50) 828.
 - wild, relation to wheat rust, (46) 449.
 - wild, rôle in stem rust epidemics, (43) Iowa 654.
 - yields, (45) 737; (49) 735.
- Grasshopper—
- campaign, (50) 153.
 - campaign, financing, (50) Colo. 52.
 - campaign, Manitoba, papers on, (47) 756.
 - catching machine, design, (43) 53.
 - repellents, (46) 657.
 - undescribed, from California, (45) 254.
- Grasshoppers—
- control, (41) Ind. 162, 251, 252, 754; (42) 154, 546; (43) 53; (44) U.S.D.A. 162, Kans. 249, Oreg. 850; (45) Me. 454, 755; (46) 153; (48) Fla. 251; (49) Mont. 152, Mont. 251, Colo. 450, Mont. 450.
 - control—
 - in Alberta, (50) 154.
 - in Iowa, (45) 455.
 - in Russia, (49) 450.
 - organization for, (43) 354.
 - differential, notes, (41) Ariz. 355; (42) Ariz. 357; (43) 757.
 - greenhouse, summary, (48) 853.

Grasshoppers—Continued.

- in Manitoba, control, (46) 458.
- methods of destroying, (44) 451.
- nema parasite of, (49) 357.
- notes, (41) Mont. 57; (43) Mont. 758; (45) Mont. 359; (50) 151.
- of New England, manual, (44) 58.
- of Tennessee, keys, (46) 153.
- on cotton, (43) U.S.D.A. 352.
- on wheat, (43) Ind. 352.
- poison bait and Kedzie mixture, (47) Mich. 697.
- poison bait for, (43) 353; (44) N.Dak. 58, Mont. 348; (45) 151, Mich. 251, 853; (46) 53, 657; (47) Wis. 452, 757; (48) Mich. 251; Nebr. 551; (49) Wis. 654.
- poison bait for, preparation, (44) 58; (48) Mont. 153.
- poison bait for, sodium arsenite in, (49) Colo. 51.
- summary, (45) Me. 254.

Grassland—*see also* Meadows and Pastures.

- climax formations, (41) 634.
- communities, structure, (49) 30.
- effect of phosphates, (48) 521.
- effect of phosphatic slag, (45) 521; (47) 26.
- effect of spring and fall grazing, (43) 824.
- effect of sulphuric acid, (44) 431.
- fertilizer experiments, (50) 122.
- formation, root development in, (45) 732.
- improvement, (45) 431.
- liming experiments, (44) 526.
- management, (41) 367; (43) 814; (46) 727; (47) 226.
- old, improvement, (41) 826.
- plowed out, lime for, (44) 422.
- reclamation by juniper, (46) 542.
- structure, rôle of grazing in, (46) 28.

Gravel—*see also* Road materials.

- and sand production, survey, (45) U.S.D.A. 290.
- impact test for, (48) 782.

Gravels, Nebraska pit-run, experiments, (50) 586.

Gravity acceleration tables, (41) 808.

Grazilaria roscipennella, notes, (47) 551.

Grazing—*see also* Range.

- as affected by rainfall, (43) U.S.D.A. 717.
- deferred and rotation system, (41) Kans. 34.
- effect of different systems on gains made by steers, (49) U.S.D.A. 866.
- experiments in North Dakota, (47) 278.
- in national forests, (43) 148; (46) U.S.D.A. 542.
- land in United States, (41) U.S.D.A. 693.
- land situation in Saskatchewan, (49) 894.

Grazing—Continued.

- practice on national forests, (45) 539.
- research, (49) 30.
- research, plant indicators in, (41) 327.
- Grease traps, construction, (41) 589.
- Greasewood as a poisonous plant, (50) U.S.D.A. 77.
- Great Lakes-St. Lawrence ship channel, economic aspects, (48) 93.
- Great Plains, climate of, (50) 207.
- Great tit, food habits, (41) 454.
- Grebes—
 - North American, food and economic status, (50) U.S.D.A. 754.
 - underwater activities, (48) 51.
- Greeks in Egypt in third century B. C., (50) 891.
- Green—
 - apple bug, remedies, (41) 756.
 - bug, *see* Grain aphid, spring.
 - capsid, notes, (41) 354.
 - fly larvae, anaerobes from, (47) 258.
- Green manure—
 - and manure, comparison, (48) 218.
 - as affected by lime, (48) Del. 619.
 - bacteriological effects, (42) Miss. 622.
 - crops, effect on soil acidity, (47) R.I. 519.
 - crops, value, (48) Del. 621.
 - decomposition, (46) N.Y.Cornell 212.
 - decomposition by bacteria in manure, N.J. (42) 826; (44) 321.
 - effect on nitrate production, (43) Ill. 214.
 - effect on number of organisms in soil, (48) 120.
 - effect on quality of potatoes, (46) 441.
 - effect on seed germination, (41) 523.
 - effect on soil acidity, (42) Va. 324; (43) 212.
 - effect on soil bacteria, (41) Ga. 130.
 - fertilizing value, (45) Guam 23; (46) 817, 818; (47) 24, Miss. 217, R.I. 419.
 - for chlorotic pear trees, (49) 755.
 - for paddy soils, (43) 423.
 - for soil improvement, (45) Wis. 214.
 - pitting and rotting, (41) 721.
 - rate of nitrification, (42) 18.
 - relation to wheat take-all, (43) 153.
 - use, (41) 626; (45) Mo. 24; (47) R.I. 725; (49) R.I. 510.
 - value of whole plants and parts, (49) 121.
 - with bone meal, fertilizing value, (48) 434.
- Green manuring—
 - effect on dry farming, (49) Nebr. 527.
 - effect on rock phosphate availability, (46) 320.
 - experiments, (41) N.J. 19, Del. 136; (42) 98, 218, Va. 427, Calif. 822; (43) Md. 122, Md. 133; (44) R.I. 22, N.Dak. 31, 317; (46) R.I. 213, N.J. 514, 623; (47) 25, Miss. 217; (48) N.J. 324; (49) 121.

Green manuring—Continued.

- experiments in Bombay, (42) 518.
- for citrus groves, (42) Calif. 830.
- for South African soils, (42) 515.
- general features and results, (48) 22.
- in India, (41) 814; (47) 815.
- plants in India, decomposition, (48) 22.
- studies, (47) U.S.D.A. 319; (49) Miss. 420.
- table, (47) 217.
- v. manure, (48) 21.
- with cowpeas, (41) Mo. 624.

Green—

- scale, notes, (47) 53.
- scale, soft, in Panama, (45) 655.
- soldier bug, *see* *Nezara hiliaris*.

Greenheart, use as reinforcement for concrete, (42) 586.

Greenhouse—

- cockroach, studies, (41) Conn.State 158.
- crop diseases and control, (48) 847.
- insects, control, (48) 153; (50) 255.
- inspection work in Indiana, (45) 253.
- leaf-tyer, studies, (41) 460.
- mealybug, notes, (41) 756.
- pests, control, (48) N.Dak. 52.
- plant diseases, relation to water supply, (45) 841.
- plants, aerial fertilization with carbon dioxid, (41) Vt. 833.
- seasonal climatic conditions, (47) Md. 411.
- soil, sterilization, (41) 339; (49) Ind. 540, Ind. 636.
- soil, value of muck for, (44) 719.
- thrips, notes, (47) 53, U.S.D.A. 157.
- thrips on avocado, (43) 255, 851.
- thrips out of doors in Georgia, (49) 153.

Greenhouses—

- and forcing beds, construction, (50) 834.
- carbon dioxid for, method of supplying, (49) 741.
- chrysanthemum midge in, (43) U.S.D.A. 360.
- concrete, construction, (43) 90.
- construction, (41) 339; (49) U.S.D.A. 487.
- fumigation, (41) N.J. 58; (49) 758.
- heating, (41) 587; (49) U.S.D.A. 487.
- monthly working calendar for, (43) 236.

Greensand—

- and sulphur, effects on soil potash, (43) Md. 121.
- as source of potash, (41) N.J. 23; (46) 719.
- effect of sulfofication, (43) 517.
- marl, use, (49) 624.
- New Jersey, potash exploration in, (43) 817.
- poisonous, cause of toxicity, (49) 22.

Greensand—Continued.

- potassium availability as affected by sulphur, (48) 724.
- Gregarines, new, list, (48) 462.
- Grenade powder, nitrostarch, and trinitrotoluol for blasting, (44) U.S.D.A. 585.
- Grevillea spp., studies, (42) 348, 349.
- Grewiaccoccus, new genus, erection, (42) 155.
- Griggsia cyathea n.g. and n.sp., description, (42) 151.
- Grillacris sp., notes, (49) 550.
- Grinding wheels, selection and use, (44) 287.
- Grippe, course of disease as affected by diet, (45) 163.
- Grippe, human and equine, comparison, (48) 676.
- Grit, amount present in gizzards of hens, (50) N.C. 274.
- Grocery stores in Fargo, economic study, (43) N.Dak. 368.
- Ground pearl, notes, (48) V.I. 354.
- Ground squirrels, *see* Squirrels.
- Groundnuts, *see* Peanuts.
- Grouse locust, linkage in, (44) 470.
- Growers' national marketing agency methods, (48) U.S.D.A. 789.
- Growth—
 - acceleration by administration of hypophyseal substance, (47) 69.
 - and antiscorbutic substance, (48) 760.
 - and development of pig, embryonic, (46) 263.
 - and hydration, defining physical constants, (41) 27.
 - and hydration, studies, (43) 428.
 - and reproduction on simplified food supply, (44) 760; (45) 864; (46) 862; (48) 160.
 - and senescence, chemical basis, treatise, (50) 569.
 - availability of energy for, (41) 769.
 - effect of—
 - inbreeding, (41) 865, 866.
 - organic nutrients on, (42) Wis. 371.
 - thyroid and parathyroid feeding, (47) 373, 374.
 - thyroid and parathyroid loss, (48) 870.
 - in animals, (49) 164.
 - in organisms, studies, (41) 25, 26, 132
 - in pigs, relation to vitamin A, (46) 64.
 - inhibiting substance in Chinese lemon, (42) 335.
 - motive force, defined, (44) 265.
 - of pigs, proportion of milk for maximum, (44) 174.
 - of rats, effect of vitamin A and ultra-violet light radiation, (49) 60, 61.
 - of steers, composition at different stages, (44) 569.
 - of tadpoles, nutrition studies, (41) 468.

Growth—Continued.

- physiology, (45) 769.
- promoting properties—
 - of baker's yeast, (41) 169.
 - of cabbage, (41) 167, 168.
 - of lactalbumin, (41) 465, 466.
- rapidity in relation to age, (47) 75.
- rate of animals, (46) 672.
- rate, relation to age in willows, (49) 424.
- relation to hypophysis, (41) 270.
- response to radiation, (50) 364.
- rings, daily, in cell wall of cotton hairs, (43) 633.
- studies with rats, (42) 559; (45) 164, 764; (46) 264, 566.
- studies with white mice, (41) 766; (44) 265.

Grubs, white, *see* White grubs.

Gryllotalpa—

- gryllotalpa*, notes, (44) 351.
- spp., of Java, (41) 847.
- vulgaris*, *see* Mole crickets.

Gryllus—

- abbreviatus*, control, S.Dak. (41) 251; (42) 850; (44) 652.
- assimilis*, life history studies, S.Dak. (47) 451; (49) 549.
- domesticus*, *see* Cricket.

Guaiacol, effect on tubercle bacillus, (44) 279.

Guam Station, report, (42) 92; (45) 94; (46) 793; (49) 494.

Guanaco, hair structure, (44) 467.

Guano—

- analyses, (42) 626.
- bat, analyses, (41) 428.
- bat, deposits of Rhodesia, (46) 320.
- bat, fertilizing value, (43) Mo. 721; (45) Guam 23, Mo. 121; (50) 322.
- of Guano Islands, South Africa, (41) 627.
- of Sardinia, analyses, (43) 24.
- Peruvian, fertilizing value, (41) 218.
- resources of Uruguay, (42) 328.
- whale, fertilizing value, (43) Can. 727.

Guanol—

- as source of carbon dioxide, (50) 626.
- fertilizer, decomposition of betain in, (43) 27.
- fertilizing value, (44) 25, 625; (46) 321.
- manufacture and fertilizing value, (42) 525.
- use on moor soils, (45) 518.

Guar, culture directions, (45) 35.

Guar, culture experiments, (49) Tex. 429.

Guarana, caffeine content, (41) 412.

Guatemala grass—

- culture experiments, (48) V.I. 333.
- notes, (49) Guam 427.

Guavas—

- composition, (48) 708.
- culture experiments, (42) 736; (43) 40; (46) 735.
- fruit fly injurious to, (42) 152.
- jellying properties, (49) Hawaii 411.

Guavas—Continued.

- pruning experiments, (46) 735.
- studies in India, (46) 640.
- vitamin C in, (49) 563.

Guignardia—

- bacca*, notes, (49) 547.
- bidwellii*, notes, (42) 49.
- vaccinii* on cranberries, (44) Mass. 848; (45) U.S.D.A. 54.

Guinea—

- corn smut, (42) 145.
- fowl, raising, (42) 563.
- grass, composition and feeding value, (48) 67.
- grass, notes, (49) Guam 427.

Guinea pigs—

- as protection against malaria, (47) 554.
- birth weight, factors affecting, (49) 864.
- complement deficient, blood elements in, (49) 880.
- domestication in Peru, (41) 869.
- effect of inbreeding, (49) 567.
- effect of lactation on sexual cycle, (46) 871.
- effect of removal of the mammary glands, (49) 864.
- effect of underfeeding on oestrous cycle, (44) 173.
- epizootic among, (49) 262.
- exhibition standards, (43) 575.
- experimental crosses, (45) 370.
- genetic experiments with, (49) 864.
- glycogen and glucose in muscles, (49) 570.
- immunization against *Bacillus abortus*, (48) 580.
- inbreeding and crossbreeding, effect, U.S.D.A. (48) 263, 469.
- inheritance in, (46) Kans. 476.
- inheritance of congenital palsy, (42) 764.

- intravenous administration, (45) 478.
- microorganisms in lungs of, (48) 278.
- oestrous cycle in, (42) 668.
- oestrus and fecundity in, (48) 471.
- prenatal growth of, (44) 266.
- raising and marketing, (42) 770.
- sex ratios in, (49) 864.
- synthetic white, (42) 764.
- thyroidectomized, behavior toward scorbutic ration, (49) 766.
- tricolor inheritance in, (42) 764.
- tuberculosis, weight curves, (45) 581.
- two new color factors in, (49) 368.

Gullies, prevention and reclamation, (47) U.S.D.A. 19.

β -Guloheptose, preparation from gulose, (42) 503.

Gulose, heptoses from, (42) 503.

Gum acacia, effect on circulation, (43) 79.

Gum arabic—

- adsorption in solution and at interfaces, (47) 802.
- gold number determination, (43) 12.

Gum—

- in sugar products, determination, (48) 505.
- levan, formation by mold spores, (44) La. 116.
- levan formation from sucrose, (50) 410.
- production and marketing in the Sudan, (45) 538.
- resins, analysis, (44) 806.
- resins, iron content, (43) 202.
- spirits, specification, (44) U.S.D.A. 207.
- tree ashes, fertilizing value, (43) 324.

Gumbotils, colloidal properties, (49) 811.

Gummosis—

- and mosaic, relation between, (47) 48.
- dry, in plants, (47) 348.
- of cotton, (45) 649.
- of garden plants, (43) 346.
- of orange, (45) 653.
- of rubber plant, (48) 352.
- studies, (41) Ga. 49.

Gums—

- and resins, handbook, (41) 110.
- chemistry of, progress, (41) 614, 801.
- from Philippines, (44) 640.
- from waste sulphite liquor, (42) 615.
- iron content, (43) 202.
- paper on, (48) 842.
- sources and uses, (48) 239.
- substitutes in Germany, (43) 204.

Gur, effect of soil and water on hardness, (42) 713.

Gur making from date palm juice, (45) 209.

Gurjun, properties and uses, (49) 43.

Gutta percha, sources and uses, (48) 239.

Gutta percha substitutes in Germany, (43) 204.

Gutters, concrete, construction, (43) 90.

Gymnoascus luteus on Brie cheese, (42) 877.

Gymnoconia interstitialis, notes, (45) 751.

Gymnosperms, vacuolar systems in, (44) 822.

Gymnosporangium—

- clavipes, aeciospores, (48) N.H. 544.
- clavipes, temperature of spore germination, N.H. (43) 842; (46) 343.
- cupressi, notes, (47) 839.
- juniperi virginianae, studies, (41) W.Va. 53; (46) 451.
- on hawthorne and cedar, (48) 747.
- Russian species, (43) 731.
- spp., Swedish, studies, (42) 726; (45) 444.
- studies, (41) 152, 746.

Gymnosporium macropus, notes, (46) 543.

Gymnostylia argentina, parasitism by, (47) 657.

Gynacantha bainbriggei, oviposition, (47) 358.

Gynocardia oil, chemistry, (47) U.S.D.A. 241.

Gypona north of Mexico, review, (41) 456.

Gypona octolineata, biology, (46) 51.

Gypsonoma neglectana, notes, (50) 554.

Gypsum—

- ammonia-fixing capacity, (41) 521.
- ammonium carbonate transformation with, (46) 819.
- ammonium nitrate, composition and action, (46) 820.
- ammonium nitrate, fertilizing value, (45) 330; (47) 322; (49) 623.
- analyses, (43) Oreg. 129; (48) Mass. 522.

deposits of United States, (44) 423.

determination in soil, (47) 18.

effect on—

- acid soil nutrients, (47) 518.
- alkali soil, (43) Ariz. 724; (44) U.S.D.A. 419; (47) 123; Calif. 619.
- black alkali lands, (48) 812.
- composition of soil extracts, (43) Mich. 124.
- concrete, (42) 583; (47) Wyo. 189.
- nitrogen loss, (42) 124.
- potash solubility, (41) 126.
- soil reaction, (46) 719.
- soil solutions, (47) 512.
- soils, (42) Mich. 331.
- solubility of soils, (43) 516.
- fertilizing value, (41) 427; (44) 818; (46) 123, Oreg. 215, Iowa 321; (47) 21, 512.
- for conservation of liquid manure, (46) 818.
- in South Australia, (46) 821.
- industries fellowships, (44) 900.
- industry in 1919, (44) 516.
- on Iowa soils, value, (49) Iowa 723, 726.
- production in United States, (44) 130; (50) 727.
- production, use, and exportation, (42) 221.
- resources of United States, (49) 124.
- sources and use, (42) 525.
- transformation into ammonium sulphate, (48) 621.
- use in conservation of liquid manure, (42) 721.
- use to prevent nitrogen loss from manure, (44) 817.
- uses in agriculture, (49) 124.

Gypsy moth, *see* Gipsy moth.

Habrobracon—

- brevicornis—
 - biology, (48) 856.
 - identity, (47) 557.
 - inheritance in, (47) 173.
 - notes, (49) La. 848.
 - rearing, (46) 456.
 - studies, (46) 463.
- juglandis, life history notes, (50) 663.
- new species, (46) 58.
- politiventris n.sp., description, (42) 655.
- spp., biological observations, (47) 762.

Habrocytus—

- cionida, oviposition, (47) 261.
- cionida, parasitism by, (47) 261.
- languriae, notes, (44) U.S.D.A. 164.
- medicaginis, notes, (43) U.S.D.A. 365.
- rhodobaeni, notes, (48) 359.
- simillimus n.sp., description, (41) 64.

Habronema—

- megastoma, development and transmission, (48) 86.
- megastoma, life cycle, (47) 257.
- megastoma, notes, (47) 589.
- relation to flies in Queensland, (50) 455.
- spp., development in flies, (48) 284.
- spp., life history, (43) 585, 883.
- spp., notes, (50) 359.
- treatment for, (46) 686.

Habronemiasis—

- cutaneous, discussion, (47) 585.
- diagnosis, technique, (46) 82.
- equine, transmission by house fly, (48) 86.
- studies, (43) 585; (46) 184.

Habronemic conjunctivitis, (41) 84.

Habronemoses of horses, (49) 283.

Hackberry arricciamento, description, (42) 450.

Haddock oil, vitamin A content, (46) 567.

Hadena—

- fractilinea, notes, (44) N.J. 349.
- fractilinea on corn, notes, (42) Ohio 852.
- oleracea, control, (41) 339; (43) 454; (46) 53.
- oleracea, habits and control, (44) 456.
- semicana, notes, (43) Conn.State 251.

Hadronotus ajax, notes, (45) 459.

Hadronotus antestiae, studies, (48) 53.

Haemaphysalis—

- bispinosa, notes, (47) 487.
- leachi, notes, (43) 84; (48) 279.
- leporis-palustris, notes, (49) 256.
- leporis-palustris, transmission of spotted fever by, (48) 776.
- punctata, notes, (46) 484.

Haematobia irritans, *see* Horn fly.Haematopinus suis, *see* Hog louse.

Haemodispersus ventricosus, tularemia transmission by, (46) 152.

Haemogregarina canis, studies, (45) 183.

Haemonchosis in sheep, (41) 873.

Haemonchus contortus—

- effect on coagulation of blood, (45) 477.
- extracts, experiments, (46) 379.
- in goats, (46) 883.
- in sheep, (45) 182; (46) 685, 883.
- notes, (44) 77.
- summary, (47) Okla. 85.

Haemonchus similis, notes, (49) La. 283.

Haemonchus spp., studies, (46) La. 281.

Hail—

- as affected by airplanes, (43) 618.
- frequency and distribution, (43) U.S.D.A. 119.

Hail—Continued.

- frequency in Sweden, (43) 621.
- injury, notes, (44) Pa. 745.
- insurance in Germany, (44) 593.
- insurance on farm crops, (44) U.S.D.A. 291.

Hailstorms, papers on, (43) U.S.D.A. 511.

Hair—

- anthrax infested, disinfecting, (46) 480.
- causes of whiteness in, (46) 264.
- changes in color as affected by temperature, (49) 165.
- mammalian, preparing sections, (50) 467.
- of domestic animals, studies, (47) 81.
- of mammals, characteristics, (44) 467.

Hairlessness—

- in pigs, remedy, (46) Mont. 374.
- prevention, Wash. (43) 384, 784.

Hairy vetch, *see* Vetch.

Halazone as water disinfectant, (41) 583.

Haldu, description and distribution, (47) 43.

Halerpestis cymbalaria, poisonous to livestock, (43) Nev. 273.

Halobaena caerulea, nomenclature, (42) 355.

Halogens—

- bactericidal effect on tetanus, (44) 780.
- in air, copper flame test, (42) 313.

Halophytes—

- germination and growth, effect of salinity of water, (49) 730.
- habitats of, (42) 628.

Halos, papers on, (43) U.S.D.A. 718.

Haltica—*see also* Altica and Flea-beetle.chalybea, *see* Grape flea-beetle.

oleracea, control, (49) 252.

oleracea, life history, (45) 558.

Halticini—

- annotated list, (45) Md. 858.
- of College Park, list, (43) Md. 158.

Halticus citri, studies, (45) U.S.D.A. 858.

Ham—

- curing, (41) 488.
- curing, effect on trichinae, (44) U.S.D.A. 80.
- curing, English methods, (49) 470.
- curing on the farm, (49) 272.
- curing, sugar substitutes for, (44) U.S.D.A. 557.
- gastric response to, (41) 857.

Hamasporea gedeani, notes, (46) 829.

Hamilton, J., biographical sketch, (45) 98.

Hammer handles, Indian woods for, (47) 289.

Hampton Institute, history and organization, (50) 194.

Hampton Institute, notes, (42) 696.

Haploa—

- colona, notes, (45) 159.
- lecontei, injurious to apple trees, (46) Ky. 157.
- reversa, summary, (49) Ark. 253.

- Haplogonatopus*—
orientalis n.sp., description, (43) 857.
vitiensis, parasitism, studies, (42) 249.
- Haplographium chlorocephalum*, description, (49) 445.
- Haplophthalmus danicus*, notes, (50) 255.
- Haplothrips*, key, (41) 847.
- Haplothrips* statices, notes, (49) 850.
- Hardback grubs in Antigua, (41) 462.
- Hardiness in plants, (48) 233, 234.
- Harding grass, adaptation and behavior, (48) Calif. 527.
- Hardpan—
 effect on root development, (49) 30.
 in Apulian soils, origin, (48) 814; (50) 14.
 subsoils, effect of lime and organic matter, (49) Okla. 420.
- Hardwood—
 diseases, (46) 454.
 distillation plants, tar-still in, (43) 717.
 forests of Western Australia, (49) 837.
 insects affecting, (50) 153.
 stands, reproducing, (48) 739.
- Hardwoods—
 and coniferous woods, distinguishing, (47) 443.
 for paving, (44) 285.
 of Australia, uses, (43) 149.
 seasoning, water-spray dry kiln for, (44) U.S.D.A. 286.
 suppression of white pine by, (47) 42.
 windfall injuries, (46) 645.
- Hares—
 Belgian, as meat producers, (42) 770.
 Swiss Field and Alpine, osteological differences, (49) 66.
- Harlequin cabbage bug, summary, (42) U.S.D.A. 852.
- Harmolita—
aequidens, notes, (49) 255.
grandis, control, (49) U.S.D.A. 558.
grandis minutum, migration of, (42) 754.
lolii n.sp., description, (48) 59.
phyllotachitis n.sp., description, (46) 857.
 revision and new species, (41) 667.
 spp., life history and habits, (42) U.S.D.A. 752.
 spp., notes, (50) 51.
tritici, see Wheat jointworm.
vaginicum, control, (47) 58.
- Harmologa fumiferana*, see Spruce budworm.
- Harness repairing, (46) 891.
- Harness repairing, handbook, (47) 793.
- Harpipteryx* sp. on Tartarian honeysuckle, (41) Conn.State 159.
- Harrowing, tractor cost, (41) Pa. 486.
- Harrows—
 disk, (47) 190, Iowa 792; (48) 198.
 for vineyards, tests, (41) 887, 888.
 tests, (42) 185.
- Harvard Forest, management, (46) 842.
- Harvest—
 dates, temperature influence on, (41) U.S.D.A. 716.
 labor, historical account, (46) 389.
 labor in Kansas, handbook, (45) 594.
 labor in wheat belt, (47) U.S.D.A. 192.
 labor, studies, (48) 891.
 labor survey, (47) 193.
 service project in Kansas, (45) 492.
- Harvester development, (48) 888.
- Harvesting machinery—
 for corn, (45) 186.
 for oats, (48) 186.
 new, (41) N.Dak. 289.
 notes, (43) 892.
 treatise, (42) 686.
- Harvesting, tractor costs, (41) 790.
- Hatch Act, editorial, (50) 2.
- Hatch farm, bequest for agricultural experimentation, (50) 1.
- Hawaii—
 College, notes, (41) 199; (42) 695.
 Station, notes, (41) 898; (43) 398; (48) 796.
 Station, report, (41) 198; (44) 94; (46) 698; (48) 396.
 University, notes, (45) 900; (47) 600.
- Hawaiian Pineapple Cannery Experiment Station, notes, (48) 397.
- Hawks in California, (47) Calif. 549.
- Hawkweeds, eradication, (42) Va. 439; (44) U.S.D.A. 144.
- Hawthorn—
 blossom weevil, life history and habits, (46) 463.
 infection by *Gymnosporangium*, (48) 747.
 insects affecting, (48) N.Y.Cornell 153.
 silver-leaf, notes, (49) 845.
- Hawthorns—
 culture in New Zealand, (49) 837.
 native for gardens, (45) 347.
 wild, hosts of fruit pests, (44) 548.
- Hay—see also specific kinds.
 analyses, (42) 30; (47) Conn.State 570.
 and pasture mixtures, comparison, (50) Can. 433.
 annual crops and mixtures, (49) Can. 734.
 as affected by phosphatic slag, (48) 122.
 as affected by potash and kainit, (44) 515.
 as affected by weather, (47) Minn. 116.
 as ranch feed, (47) 75.
 Association, National, proceedings, (41) 641.
 bales, weight variation, (49) Oreg. 526.
 baling, (41) U.S.D.A. 455.
 brown, (41) Wash. 232.
 chopped, digestion coefficients, (43) 266.

Hay—Continued.

comparative feeding value, (44) 71.
 cost of production, (41) Minn. 91;
 (47) Mo. 192; (49) N.Y.Cornell
 691; (50) Can. 592.
 cost studies, (50) Can. 432.
 crops—
 ammonium nitrate for, (41) 424.
 and rowen in rotations, (41) R.I.
 434.
 climatic requirements, (41)
 U.S.D.A. 417.
 culture experiments, (41) Nebr.
 638; (43) Mont. 332; (47)
 Alaska 527.
 field tests in Nova Scotia, (41)
 729.
 for Alaska, (41) Alaska 30.
 for Minnesota, (42) Minn. 824.
 for Ontario, (41) 334.
 notes, (43) 527.
 phosphates for, (41) 723.
 rotation fertilizer tests, (44) 632.
 short season tests, Mich. (42)
 631; (43) 333; (47) 131.
 sodium for, (41) R.I. 426.
 tests, (49) 825.
 yield cycles, (41) 892.
 curing tests, (44) Oreg. 826.
 cutters, experimental studies, (45)
 393.
 damage from various causes, (44)
 U.S.D.A. 118.
 elevators and transporters, (42) 589.
 energy value, (47) 69.
 ensiling, Italian method, (50) 468.
 feeding value, (46) Wyo. 676, 765;
 (47) 75, 378.
 fertilizer experiments, (44) R.I. 23;
 (45) Can. 817; (46) 726; (47) 814.
 fire line, feeding value, (49) 171.
 for wintering lambs, (50) 574.
 from cereals, studies, (47) Calif. 631.
 from immature plants, vitamin con-
 tent, (41) 762.
 grades, (44) 229; (46) 30.
 grain, notes, (47) Alaska 527.
 harvesting, labor requirements, (48)
 33.
 infusions for calves, (44) 776.
 inspection and grading, (46) U.S.D.A.
 228.
 Italian method of ensiling, (47) 865.
 land, bog, soil-application and fer-
 tilizer treatment, (41) 230.
 land, fertilizer experiments, (49) N.H.
 328.
 legume, effect on cost of milk produc-
 tion, (44) 370.
 liming experiments, (42) Minn. 826;
 (45) Can. 817; (46) Md. 321.
 market, shrinkage, (43) U.S.D.A. 825.
 marketing at terminal markets, (46)
 U.S.D.A. 180.
 marketing, methods, (47) U.S.D.A.
 693.
 meal, digestion coefficients, (43) 266.

Hay—Continued.

methods of handling, (49) Colo. 86.
 minimum amount for milch cows, (49)
 780.
 mixtures, seeding experiments, (50)
 Can. 533.
 mowing costs, (49) 86.
 mows and stacks, spontaneous combus-
 tion, (48) 889.
 nonleguminous, digestibility, (47) Tex.
 472.
 official grades in Idaho, (47) 393.
 plants, list for northeastern United
 States, (44) U.S.D.A. 332.
 position in American agriculture, (49)
 U.S.D.A. 389.
 prairie, as affected by pepto-humic
 fertilizer, (44) 420.
 preparation and marketing, (46)
 U.S.D.A. 129.
 prices, fluctuations, (43) U.S.D.A. 794.
 production, factors affecting, (50)
 534.
 production, trade, and foreign compe-
 tition in, (49) 794.
 rack design, (49) Mich. 487.
 rotation experiments, (45) R.I. 529.
 rotation systems for, (48) 529.
 spontaneous combustion, (45) 127;
 (47) 227.
 stacks, measurement, (43) 290.
 statistics, (42) U.S.D.A. 731.
 uniform grades, need for, (44) 228.
 v. oats and wheat straw, (46) 765.
 v. silage, feeding value, (47) Pa. 478.
 variety tests, (47) Mich. 129.
 weighing for market, (46) U.S.D.A.
 228.
 yield as affected by weather, (49) 115.
 yield, factors limiting, (49) 21.
 yields in New Jersey, (46) 225.
 Haying with motorized outfits, (47) Miss.
 293.
 Haymaking machinery—
 elevators and transporters, (42) 589.
 paper on, (48) 198.
 recent improvements in England, (42)
 489.
 Hazel leaves and twigs, feeding value, (45)
 774.
 Hazel wood, water conductivity, (41) 328;
 (43) 31.
 Hazelnut—
 cake, feeding value, (42) 369.
 oil, nature of, (47) 12.
 scale, notes, (43) 252.
 weevil in Italy, (41) 555.
 Hazelnuts—
 nutritive value, (41) 557.
 supposed parthenocarpelly in, (45)
 731.
 Header attachment, homemade, (41) 487.
 Health—
 and atmospheric environment, (44)
 U.S.D.A. 717.
 and daily diet, (49) Ark. 364.
 books for school children, (46) 898.

Health—Continued.

- education and nutrition class, (48) 692.
- education in elementary schools, (45) 697.
- education in rural schools, (46) 194.
- indexes, use of weight-height-age tables, (50) 853.
- problems, program for study, (50) 298.
- public—
 - educational tours, (44) 495.
 - historical articles, (47) 164.
 - methods in Portland, Oregon, (48) 462.
 - relation to bovine diseases, (49) 277.
 - relation to medical entomology, (47) 847.
 - relation to milk, (47) 164.
 - relation to parasitic worms, (48) 550.
 - treatise, (42) 863.
- rural v. city, (46) 294.
- supervision, plan for, (50) 94.
- survey of Missouri Tuberculosis Association, (49) 193.

Heart—

- as affected by adrenalin, (44) 374.
- nuts, culture experiments, (50) Minn. 138.
- zinc content, (45) 64.

Heartwater of sheep, notes, (41) 879.

Heat—see also Temperature.

- coagulation of milk, endothermic chemical reaction, (49) 716.
- conductivity of brick wall work, (49) 138.
- convection currents, instrument used in investigating, (49) 188.
- effect on critical periods of plant growth, (43) 207.
- effect on horse serum, (47) 86.
- effect on microbiological activities in soil, (50) 620.
- effect on properties of milk, (50) Pa. 411.
- effect on vitamins, (47) 768.
- emission from warm-air furnace, (50) 589.
- for control of cereal insects, (47) Ohio 358.
- insulating materials, tests, (46) 692.
- insulators for cold storage work, (49) 186.
- loss through types of building, (46) 691.
- losses due to wind, (47) 488.
- losses through walls and roofs, (50) 389.
- moist and dry, action on vitamin B, (50) 858.
- production by bees in winter, (46) U.S.D.A. 254.
- production, calculating, in ruminants, (48) 871.
- production, effect of acids, (47) 63.

Heat—Continued.

- production of school children, (49) 763.
 - regulating mechanisms of body, (45) 671.
 - resistance in embryo of sunflower, (50) 325.
 - resistance of *Bacillus botulinus* spores, (49) 162.
 - resisting capacities of trees, (49) 536.
 - transference and combustion in domestic boiler, (49) 688.
 - transmission—
 - by radiation and convection, (49) 187.
 - of commercial wall board, (49) Colo. 87.
 - through walls, measuring, (50) 589.
 - through window shades, (42) 590.
 - through windows, (44) 588.
 - treatises, (47) 390.
 - use against stored grain pests, summary, (49) 153.
- Heather, effect on pine forest, (43) 24.
- Heather, feeding value, (42) 369, 769.
- Heating—
- by electricity, (41) 587.
 - domestic, estimation of pipe required, (42) 590.
 - domestic, in Switzerland and United States, (42) 590.
 - of houses, fuel-saving possibilities, (49) 186.
 - of houses with kerosene oil, (49) 185.
 - plants, home, installation and operation, (45) U.S.D.A. 188.
 - system, hot-water, design, (43) 486.
 - system, hot-water, effect of pressure on circulation, (49) 591.
 - system, hot-water, selection for domestic use, (44) 588.
 - systems for animal shelters, (46) 491.
 - systems, radiation calculation charts, (46) 386.
 - systems, warm-air, studies, (49) 288.
 - warm-air, merits, (50) 97.
 - with straw gas, (42) 685.
- Hedera helix*, cytological observations, (44) 728.
- Hedges, demonstration plantings, (42) N.Dak. 738.
- Hedges for Nebraska, list, (43) 240.
- "Hedging" in futures markets, effect on grain business, (42) 290.
- Hedymeles melanocephalus*, notes, (41) 547.
- Hegari—
- cracked, analyses, (44) Ariz. 568.
 - culture, (45) Ariz. 738.
 - prussic acid content, (42) Fla. 830.
 - variety tests, (42) Tex. 828.
 - yields, Ariz. (43) 733; (44) 524.
- Heifers—
- alfalfa v. clover hay for, (49) Ohio 375.

Heifers—Continued.

- composition of secretions from udders during pregnancy, (49) 781.
- cost of raising, Can. (43) 777; (50) 676.
- costs and returns, (47) N.Y. Cornell 578.
- dairy, feed consumption, (45) Can. 879.
- dairy, methods of developing, (49) Kans. 473.
- effect of nutrition and age of breeding, (48) Mo. 669.
- feeding experiments, (45) Okla. 470; (47) Calif. 673.
- feeding, managing, and caring for, (48) 273.
- French Canadian, feed cost of raising, (41) Can. 572.
- growth and feed costs, (47) 781, Iowa 782.
- growth studies, Nebr. (48) 76, 668.
- nutrition of, (45) Mo. 268.
- pasturing experiments, Minn. (43) 671; (47) 174; (48) 377.
- protein requirements, Mo. (41) 676; (43) 776; (46) 371.
- sterility in, (45) 885.
- virgin, composition of fluid from udders, (47) 79.
- wintering, (41) Mo. 77; (44) Kans. 471, Oreg. 871; (45) Va. 678; (49) Ind. 579, Oreg. 579, Idaho 779; (50) Mo. 875.

Heilipus—

- lauri, notes, (47) U.S.D.A. 157.
- perseae n.sp., (44) 460.
- pittieri n.sp., description, (41) 260.
- Helcostizus rufiscutum n.sp., description, (42) 655.
- Helianthus ciliaris, eradication, (47) Tex. 436.
- Hellanthus grafts, studies, (50) 224.
- Helicella virgata, parasite on, (42) 454.
- Heliophila latiuscula, notes, (48) 357.
- Heliophila spp., see Army worms.

Heliothis—

- assulta, notes, (42) Guam 53; (45) 551.
- obsoleta, see Cotton bollworm.
- virescens, control, (49) V.I. 353.
- virescens, notes, (50) V.I. 555.

Heliothrips—

- haemorrhoidalis, see Greenhouse thrips.
- indicus, history and habits, (47) 850.
- indicus, studies, (46) 559.
- rubrocinctus, notes, (45) 550; (47) 54.

Heliotropism in assimilating plant cells, (44) 823.

Heliotropism, theory, (46) 527.

Helium, anaerobic experiments with, (46) 25.

Helium, soil aeration with, (45) 334.

Helix pisana—

- as citrus pest, (50) 657.

Helix pisana—Continued.

- in California, (41) 548.
- poison bait for, (50) 553.
- Hellebore, black, diseases, (46) 44.
- Helminthosporium—
 - and wheat foot rot, (47) 247.
 - avenae, notes, (50) 548.
 - disease of rice, (48) 349.
 - disease of wheat and rye, (44) Minn. 745.
 - gramineum, control, (48) Can. 450.
 - gramineum, notes, (44) 747; (45) 49; (46) 545; (47) Wis. 446; (49) Wis. 643.
 - graminicolous species, (49) 747.
 - heveae in Sumatra, (50) 754.
 - heveae, studies, (42) 542.
 - incurvatum, notes, (44) 547.
 - morphology, (49) 244.
 - on barley, (49) 840.
 - on cereals, (47) Minn. 347.
 - oryzae on rice, (50) 246, 654.
 - sacchari, notes, (46) 45.
 - sativum on wheat, (50) 649.
 - sativum, parasitism, (49) Minn. 747.
 - sativum, resistance of barley to, (48) 451.
 - sativum, studies, (50) Minn. 144.
 - sechilcolum n.sp., description, (42) 46.
 - sp., notes, (49) Kans. 443, Ky. 541; (50) 649.
 - sp. on Kentucky blue grass, (50) 650.
 - sp. on sugar cane, (41) 450.
 - sp., undescribed, on fescue, (50) 651.
 - spp., notes, (41) 544; (43) 45, 445, 446; (44) Minn. 244, 842; (46) 240, 544, 845.
 - spp., remedies, (42) 644.
- Helminths—
 - common to man and animals, (48) 878.
 - new and little known, from British Guiana, (49) 499.
- Helopeltis theivora—
 - control, (50) 556.
 - life history, (45) 553.
 - notes, (45) 657.
- Helophorus rugosus, notes, (50) 57.
- Helotropha reniformis atra, notes, (45) 759.
- Hematology, treatise, (50) 680.
- Hemerocampa—
 - leucostigma, see Tussock moth, white-marked.
 - vetusta gulosa, notes, (41) 552.
- Hemerophila pariana—
 - notes, Conn.State (45) 149; (47) 156.
 - rapid spread of, (49) 356.
 - summary, (41) 160.
- Hemicellulose—
 - digestion in higher animals, (46) 69.
 - of apple wood, (47) 223.
- Hemicelluloses—
 - colloid chemistry, (41) 801.
 - studies, (50) 310.
- Hemichionaspis minor strachani, notes, (50) V.I. 555.

Hemileia—

- n.sp., notes, (42) 542.
- vastatrix, notes, (41) 350; (43) 445; (46) 844; (47) 44, 348, 838; (49) 150.

Hemileuca—

- lucina latifascia, habits, (44) 753.
- oliviae, parasite of, (45) 457.

Hemiptera—

- aquatic, biology of, (44) 353.
- collected by Yale Dominican expedition, (41) 847.
- life cycle in, (45) 250.
- of Connecticut, (50) 755.
- of Cranberry Lake region, (50) 453.

Hemiptera-Heteroptera—

- British, biology, (49) 252.
- of Nova Scotia, (50) 844.

Hemirhipus fascicularis, enemy of hickory beetle, (46) N.Y.Cornell 250.

Hemisarcopetes malus, notes, (42) 154.

Hemiteles micator, synonymy, (46) 857.

Hemiteles spp., notes, (48) 158.

Hemlock—

- bark as source of tannin, (41) 509.
- budworm attacking, (43) 852.
- distribution and habits, (50) 344.
- for wood-block pavement, (41) 790.
- seed, collecting and storing, (45) 838.
- undescribed timber decay, (46) 348.
- volume tables, (41) 838.
- weeping, description, (47) 147.
- western, of British Columbia, (46) 236.
- western, uses and stresses, (44) 149.

Hemoglobin—

- antigenic property, (41) 576.
- determination in blood, (49) 113.
- effect of blood regeneration, (44) 565.
- of blood as affected by muscular work, (43) 265.

Hemoglobinuria in cattle, (46) 684; (47) Nev. 185.

Hemoglobinuria in cattle, immunization, (43) 687.

Hemolysin production by streptococcus, (42) 880.

Hemolysins, production, effect of vitamin deficiency, (49) 279.

Hemophilic bacilli, growth factors, (46) 78; (47) 564.

Hemorrhage, effect on alkaline reserve and nitrogen metabolism, (42) 368.

Hemorrhagic—

- disease, unidentified, of cattle, (47) Nev. 789.
- septicemia, *see* Septicemia.

Hemotoxins from parasitic worms, (46) 379.

Hemp—

- analyses, (43) 617.
- and flax fibers, distinguishing, (49) 33.
- breeding, (49) 132.
- breeding experiments, (48) Mich. 224.
- breeding in Hungary, (49) 228.
- chaff, analyses, (42) 417.

Hemp—Continued.

culture, (43) 638; (44) 138, Wis. 225, Alaska 329, 436, 528.

culture experiments, (41) Hawaii 138, Can. 528; (43) Ky. 332; (45) 34, Wis. 228; (47) Alaska 527; (49) Alaska 426.

culture in Alaska, (41) Alaska 31.

determination of flexibility, (46) 230.—

early growth, in alkali soil, (42) Utah 28.

fertilizer experiments, (48) Ky. 129; (49) Ky. 525, Wis. 630.

fiber content, estimating, (50) 335.—

fibers, identification in paper pulp, (50) 509.

field tests, (41) N.Dak. 824.

germination as affected by organic substances, (41) 523.

grading service, (48) 438.

green, fertilizing value, (41) 814.

height of, (50) 31.

in Rhodesia, summary, (45) 535.

in textile industry, (49) 528.—

industry in Ireland, (46) 834.—

industry in Wisconsin, progress, (42) Wis. 337.

marketing, (43) Ky. 334.

Mauritius, fiber elements, (50) 434.—

Mauritius, inferiority, (50) 436.

northern seed-maturing, (49) Mich. 495.

plant, value for investigating sex inheritance, (48) 833.

production, (47) Wis. 432.—

production in French Africa, (42) 230.—

retting, (41) 641.—

seed cake, analyses, (42) 770.

seed globulin, nutritive value, (47) 660.

seed, nitrogen and oil in, (47) 128.

seed oil, digestibility, (42) 552.

seed, oil extraction from, (44) 436.—

seed oil, production, (46) 636.—

seed production, (48) N.Dak. 225.

seeding dates, (41) 230.

seeds, iron and manganese content, (49) 202.

sexual expression, factors affecting, (48) 626.

sun, analyses, (43) 829.—

sun, and manure, fertilizing value, (49) 734.

sun, as cover crop, (45) P.R. 631.

sun, as green manure, (41) 814; (42) 518.

sun, culture experiments, (44) 137, 527.

sun, fertilizer experiments, (41) 817; (48) 435.

sun, natural crosses of, (44) 429.

use in livestock feeding, (48) 568.

varieties for oil production, (44) 138.

variety tests, (48) Calif. 527; (49) Tex. 429, Wis. 630.

Hen—

- Black Leghorn, which turned white, (49) 463.
- change in color of, (45) 877.
- feathering in cocks, cause, (47) 868.
- feathering induced in male fowls, (48) 166.
- flea, biological notes, (49) 356.
- manure, effect on soil acidity, (47) R.I. 519.

Hendersonia sacchari, notes, (46) 45.

Hendersonia sp., notes, (45) 653.

Henequen—

- analyses, (43) 829.
- as binder-twine fiber, (41) U.S.D.A. 639.
- culture, (47) 229.
- industry in Yucatan, (42) 438.
- production in Yucatan, (41) 829.

Hen-peacock hybrids, (46) 575.

Hens—*see also* Chickens, Fowls, and Poultry.

- abscesses of feet, (45) 888.
- body temperature and egg production, (50) 872.
- breeding, feeding experiments, (47) 871.
- broodiness and egg production, (43) N.J. 173.
- culling, (43) Utah 872.
- digestive action in, (48) 75; (49) 373.
- egg production, *see* Egg production.
- endogenous metabolism, (50) 576.
- feed consumption per dozen eggs, (43) 674.
- fertilization of eggs, (41) 774, 871.
- genetics of fecundity in, (49) 567.
- inheritance of egg color and broodiness, (46) 272.

laying—*see also* Egg production.

- animal protein for, (50) Mont. 871.
- as affected by calcium, (46) 876.
- capacity, estimating, (48) Calif. 573.
- confinement v. range, Can. (50) 471, 779.
- correlation between time of beginning and time of cessation, (49) 776.
- cottonseed meal v. animal protein for, (49) Tex. 470.
- diseases in, treatment, (42) N.J. 885.
- egg weight studies, (43) R.I. 674.
- egg yield in relation to protein of feed, (43) Ky. 871.
- feeding, (41) N.J. 77, U.S.D.A. 869; (42) N.J. 872; (44) N.J. 269; (45) Ind. 172; (50) Can. 778.
- feeding experiments, (41) Ind. 570, N.Mex. 571, 675; (42) Calif. 871, Ohio 872; (43) Idaho 269; (44) Wash. 674;

Hens—Continued.

laying—continued.

- feeding experiments—continued.
 - (46) Tex. 365, Ind. 574, 875, Ky. 875; (47) 377, 671; (48) Ky. 172.
 - house and equipment for, (41) Wash. 292.
 - housing, (46) 782.
 - methods of watering, (45) Wash. 474.
 - poultry mustard for, (49) Can. 70.
 - protein feeds for, (47) Miss. 73, Idaho 779, Idaho 870, 871; (49) Idaho 273, Idaho 777.
 - selection, (43) Nebr. 776; (45) Ariz. 776.
 - winter management, (48) N.J. 574.
 - lime requirements, (42) Wis. 376.
 - male plumage in, cause, (49) Wis. 668.
 - position of keel bone, relation to egg production, (46) 770.
 - respiration, (48) 680.
 - selection experiments for egg production, (46) Oreg. 171.
 - setting, selection and care, (47) Mont. 476.
 - shell gland, inflammation, (44) 881.
 - time of selling, (50) Can. 272.
 - two distinct types of eggs from, (48) 766.
 - v. pullets as breeders, (50) 273.
 - v. pullets as egg producers, (42) N.J. 170, Minn. 873.
 - v. pullets, hatching results, (50) Can. 778.
 - weakness of musculature of oviduct walls, (44) 881.
 - weight, relation to production, (50) Can. 779.
 - weight, variation in, (47) 673.
- Hepatitis, notes, (44) 881.
- Hepatitis, parenchymatous, in horses, (41) 873.
- Heptitols, optical properties, (43) 801.
- Herbarium of Dr. O. Buchtien, purchase. (48) 900.
- Herbicides, comparative trials, (47) 235.
- Herd immunity, problem, (49) 585.
- Hereditary—
- factors, arrangement of, (43) 268.
 - mechanism, explanation, (49) 567.
- Heridity—
- acquired, (50) 332.
 - and environment studies with plants. N.J. (41) 42; (42) 835.
 - and hormones, treatise, (47) 568.
 - and production in cows, (44) 271.
 - and twins, (50) 731.
 - biochemic basis, (42) 224.
 - blended, calculating number of genetic factors, (48) 66.
 - chromosome theory, and mitosis, (41) 861.

Heredity—Continued.

- coefficient of inbreeding, (42) 63.
- correlation, and regression, (48) 868.
- factorial values, tabulation, (43) 668.
- in alfalfa, (48) Ariz. 433.
- in apples, (45) Vt. 835.
- in bacteria, (47) 125.
- in barley, (41) 639; (42) 133; (44) U.S.D.A. 34, 35; (49) 130.
- in barley hybrids, (50) 228.
- in beans, (43) 818; (47) 524; (49) 822.
- in bees, (49) 453.
- in *Campanula carpatica*, (43) 632.
- in castor beans, (41) 223.
- in cats, (44) 362.
- in cattle, (43) 375, 669, 672; (44) 267.
- in cattle, conference on, (48) 700.
- in *Cichorium intybus*, (41) 223.
- in corn, (41) 436, U.S.D.A. 437, 726, 733, 827; (42) 231, S.Dak. 231, Minn. 338; (43) 529; (44) 25, 726, U.S.D.A. 734; (45) 523; (47) 326; (48) 630; (49) 225, 632, 826.
- in cotton, (45) Tex. 229, 342; (50) 531.
- in cowpeas, (41) 828.
- in *Crepis*, (47) 325, Calif. 629; (43) Calif. 526.
- in crossbred cattle, (45) 475.
- in *Datura*, (44) 726; (46) 430; (47) 222, 524, 525.
- in *Drosophila*, (41) 175, 867, 868; (48) 367, 764, 765.
- in ducks and pheasants, (47) 667.
- in flowering plants, (45) 335.
- in fowls, (41) N.J. 75, 472; (42) 68, 671, 765, 872, Mass. 872, 873.
- in guinea pigs, (46) Kans. 476.
- in horses, (44) 67; (45) 171.
- in iris, (44) 45.
- in Japanese *Convolvulus*, (47) 524.
- in Jersey cattle, (42) 472.
- in Karakul-Rambouillet sheep, (46) 271.
- in lupines, (42) 133; (47) 822.
- in *Matthiola*, (46) 223.
- in mice, (41) 866.
- in mice and rats, (44) 67, 362.
- in mice, yellow, (41) 175.
- in oats, (41) N.Y.Cornell 641; (48) Minn. 335.
- in *Oenothera*, (41) 431; (42) 332; (43) 729, 818; (44) 26; (47) 822.
- in Orthoptera, (46) Kans. 476.
- in ostriches, (46) 573.
- in *Papaver rhoeas*, (42) 630.
- in parasitic wasps, (46) 463.
- in peaches, (43) 540.
- in petunia, (43) 222.
- in *Phaseolus*, (41) 821.
- in phlox, Pa. (47) 437; (50) 430.
- in pigeons, (43) 67.
- in pigs, (44) 767; (46) 766; (49) Pa. 269.

Heredity—Continued.

- in plantain, (44) 517.
- in plants, (47) 821.
- in *Portulaca*, (47) 629.
- in poultry, (43) N.Y.Cornell 872; (48) 471; (49) R.I. 575.
- in poultry, review, (50) 128.
- in poultry, treatise, (49) 674.
- in primula, studies, (42) 432.
- in rabbits, (44) 67, 363; (48) 762.
- in radishes, (47) 638.
- in rats and mice, (42) 762.
- in red clover, (46) 438.
- in rice, (47) 32, 36; (48) 34; (49) 34.
- in rye, (48) 531.
- in sheep, (42) Okla. 372; (44) N.H. 71; (47) Okla. 867.
- in shepherd's purse, (41) 134; (43) 434.
- in silkworms, (48) 764.
- in sorghums, (47) 634.
- in soy beans, (50) 632.
- in squash, (48) 535; (49) 822.
- in swine, (41) Kans. 74; (43) Iowa 71; (50) 128.
- in tarweeds, (47) Calif. 629.
- in tobacco, (41) 440, 736, 830.
- in trout, (43) 866.
- in unicellular organisms, (49) 567.
- in variegated plants, (43) 433.
- in vetch, (45) 524.
- in violets, (44) N.Y.State 340.
- in wasps, (47) 173.
- in wheat, (41) 235; (42) 133; (43) S.Dak. 235; (44) 832; (47) Minn. 331, 737, N.Y.Cornell 738; (49) Wash.Col. 223.
- in Y- (W) chromosomes, (49) 668.
- in zebras, (42) 375.
- mechanism of, (48) 762; (49) 165.
- Mendelian—**
 - as affected by natural selection, (41) 268.
 - mechanism, treatise, (49) 266.
 - probable errors, (42) 63.
 - theory, (41) 726.
 - under different mating systems, (41) 267, 268, 473.
- mode of and cytological explanation, (47) 667; (50) 226.
- morphological basis, (42) 630.
- new type of, (45) 370.
- non-crisscross, in *Drosophila*, (48) 165.
- of abnormal haulm type of potato, (46) 126.
- of acquired antibodies, (50) 783.
- of acquired characters, (44) 668; (45) 32; (49) 66, 822; (50) 130, 431.
- of albinism in cereals, (43) 132.
- of anatomical stem characters in grapes, (50) N.C. 131.
- of belting spotting in cattle and pigs, (46) 268.

Heredity—Continued.

- of blister mite immunity in cotton, (41) 530.
- of blotch leaf in corn, (50) N.Y. Cornell 24.
- of boll loculi number in cotton, (50) 632.
- of booting and toe characters in fowls, (42) 765.
- of branched ears in corn, (50) 528.
- of broodiness in poultry, (44) Mass. 870.
- of cancer in mice, (47) 865.
- of color, *see* Color inheritance.
- of congenital cataract in cattle, (43) 669.
- of congenital palsy in guinea pigs, (42) 764.
- of dead leaf margins in corn, (50) 529.
- of defect of hair and teeth in cattle, (43) 672.
- of defective seeds in corn, (49) 826.
- of disease resistance in beans, (45) 542; (46) 546.
- of disease resistance in tobacco, (47) 545.
- of doubleness in Begonia, (43) 632.
- of doubleness in Chelidonium, (41) 223.
- of duration of life in *Drosophila*, (49) 667.
- of dwarfing in corn, (50) 129.
- of ear length in sheep, (45) 170.
- of earliness in wheat, (44) 637; (46) 35.
- of effects of alcohol in guinea pigs, (41) 863.
- of egg color and broodiness, (46) 272.
- of egg color in silkworm, (50) 531.
- of egg weight, (43) R.I. 674.
- of embryo color in peas, abnormality in, (50) 331.
- of equilibration, (48) 567.
- of eye color in birds, (43) 866.
- of eye color in *Drosophila*, (47) 569; (49) 368.
- of fasciation, (44) 819.
- of fasciation in corn, (42) 34.
- of fat content of milk, (49) 877.
- of fecundity in poultry, (49) 273.
- of fertility in sheep, (41) 268.
- of foliar glands in peach, (48) 138.
- of fruit shape in *Cucurbita pepo*, (49) 629.
- of germless seeds, (50) 528.
- of glandular pubescence in *Crepis*, (48) 28.
- of glume length in a wheat cross, (50) 27.
- of growth and resistance in a wheat cross, (49) 750.
- of head and root formation in crucifers, (45) 345.
- of hooded character in rats, (42) 762.

Heredity—Continued.

- of hornlessness in cattle, (41) 868.
- of immunity to potato wart disease, (47) 544; (49) 753.
- of immunity to rinderpest, (43) 583.
- of kernel characters in wheat, (50) 732.
- of leafing time in beeches, (41) 331.
- of microscopic hair characters in deer mouse, (50) 731.
- of milk and meat production in cattle, (49) Wis. 676.
- of milk yield, (43) Me. 175; (48) 398; (49) 877.
- of morphological characters in *Crepis*, (50) 430.
- of mutation, (50) 729.
- of muzzle color in Stjersund cattle, (45) 69.
- of naked character in oats, (50) 227.
- of notched ears in cattle, (48) 264.
- of polydactylism, (45) 874.
- of quantity and quality of milk, (42) 771.
- of rabies, (42) 178, 778.
- of ramose inflorescence in corn, (46) U.S.D.A. 229.
- of rogues in peas, (46) 37; (49) 741.
- of rust resistance in oats, (42) 543; (46) 545.
- of rust resistance in wheat, (44) 50.
- of rust resistance in wheat crosses, (50) 634, 635.
- of scarred endosperm in corn, (48) Mo. 437.
- of seed color in red clover, (46) 634.
- of semisterility in rice, (50) 330.
- of sex intergradation in plants, (44) 218, 219.
- of sex-linked characters in pigeons, (42) 764.
- of shortness of thumbs, (50) 227.
- of silkiness in fowls, (45) 877.
- of size and conformation in sheep, (50) N.H. 26.
- of size in animals, (50) 823.
- of size in rabbits, (49) 366.
- of size in rats, (49) 864.
- of smut resistance in wheat, (43) Wash. 737.
- of spangling in poultry, (50) 528.
- of spotting in Holstein cattle, (50) 631.
- of susceptibility to parasites, (43) 841.
- of unsoundness in horses, (42) 561.
- of variegation in *Chlorophytum*, (50) 23.
- of webbed toes in man, (48) 66, 469; (50) 530.
- of weight in rabbits, (42) 763.
- of wheat smut resistance, (44) 843.
- of wheat stem rust resistance, (49) 840.
- of white markings in cattle, (50) 731.
- of wool quality in sheep, (48) 767.

Heredity—Continued.

- of yielding ability in apples, (46) 234; (48) Can. 37.
- one-sided masculine and sex-linked in fish, (48) 765.
- origin of mechanism, (49) 24.
- papers on, (49) 567.
- physical basis, (42) 560.
- process, logos of, (46) 267.
- pure line hypothesis, (43) 222.
- recent conceptions, (48) 468.
- relation to endocrine glands, (48) 67.
- relation to tuberculosis, (49) 567.
- sex-linked, application, (49) 165.
- sex-linked, in poultry, (46) Mo. 370.
- sex-linked, Y-chromosome type, (48) 67.
- statistical data on, (42) 559.
- studies, (42) 762; (44) Calif. 725; (46) 27.
- studies, value of hemp for, (48) 833.
- summary, (49) 128.
- teratological phenomena, (42) 332.
- theories basing studies on *Oenothera*, (50) 527.
- treatise, (42) 262; (43) 632; (47) 666; (48) 265.
- units in, (50) 729.
- Hermaphrodites, anatomical studies, (42) 466.
- Hermaphroditism, artificial, in rats, (46) 265.
- Heroin, crystallography, (41) 802.
- Herpetomonas—
 - ctenoccephali*, studies, (41) 781.
 - in fleas, (45) 558.
 - korschelti* n.sp., notes, (44) 353.
 - muscae-domesticae* in muscoid flies, transmission experiments, (50) 560.
 - muscae-domesticae*, morphology and life history, (50) 358.
 - muscae-domesticae*, notes, (47) 458.
- Herpotrichia nigra, notes, (42) 50.
- Herrings—
 - cold storage, experiments, (46) 258.
 - for sardines, chemical studies, (43) 111.
 - vitamin A in, (47) 662.
- Hesperiadae, Ceylonese, genitalia, (45) 658.
- Hesperiodea of America, (46) 247.
- Hessian fly—
 - control, (42) Ohio 648; (44) Ohio 163, 657; (45) 852; (48) Ohio 156; (49) 657.
 - control in Iowa, (49) 853.
 - dates for control measures, (46) Mo. 349.
 - delayed emergence, (48) 156; (50) 559.
 - host plant selection by, (48) 651.
 - in Kansas, (50) Kans. 54.
 - in Ontario, (47) 756.
 - injury, susceptibility of grain varieties to, (41) Kans. 34.
 - life cycle, (45) Mo. 252.
 - life history, (43) Ind. 352, Ind. 661; (47) Mich. 761.
 - method of study, (46) 245.

Hessian fly—Continued.

- notes, (41) 63, 64, 755, Mo. 660; (44) Kans. 249, N.J. 349; (46) Ohio 351; (48) U.S.D.A. 52; (49) Iowa 757; (50) 51.
- parasite, development, (50) 158.
- parasite, studies, (50) 58.
- parasites, distribution, (46) 464.
- parasites of, (47) 554.
- prevention, (45) 157, Ohio 458.
- rate of multiplication, (46) U.S.D.A. 352.
- resistance of wheat varieties to, (49) Kans. 453.
- studies, (41) 666; (49) Ohio 352, 657.
- summary of information, (43) U.S.D.A. 55.
- Heterakis—
 - gallinae*, treatment for, (49) 684.
- papillosa*—
 - development, (46) 281; (48) 87.
 - in turkeys, (46) 687.
 - life history and control, (44) Minn. 753.
 - notes, (43) 586; (47) Minn. 356.
 - removal from ceca of chickens, (49) 183.
 - rôle in turkey blackhead, (43) 475.
 - staining and mounting, (48) 150.
 - studies, (46) 84.
- perspicillum*, studies, (44) Kans. 281.
- spp.*, control, (50) Minn. 152.
- vesicularis*, control, (50) 82.
- Heterandria formosa, studies, (46) 157.
- Heterocampa guttivitta, notes, (41) Conn. State 159; (42) 647.
- Heterochromosome, problem in vertebrates, (45) 371.
- Heterocordylus malinus, *see* Red bugs.
- Heterodera—
 - in South Africa, life history, (47) 846.
- radicicola*—
 - control, (41) 660; (42) 243; (43) 659; (48) 827; (50) 251, 451, Fla. 652, Va.Truck 843.
 - notes, (44) Pa. 746, 842; (45) 842; (48) Fla. 646; (49) Fla. 838; (50) 42.
 - on tobacco, (43) 52, 246.
 - on tomatoes, control, (43) 47.
 - parasitism of, (43) 350.
 - studies, (42) 148, 149.
- schachtii*—
 - affecting peas, (41) 51.
 - catch plant methods for combat-ing, (48) 246.
 - control, (47) U.S.D.A. 151, 544; (49) 842.
 - factors affecting sex ratio in, (48) 246.
 - in barley, resistance to, (47) 840.
 - sp. on potato, (42) Hawaii 543.
 - spp.*, studies, (48) 51.
- Heterolysins, studies, (41) 874; (45) 680.

- Heteroneura, new genus, erection, (41) 850.
- Heterophyidae, synopsis, (44) 158.
- Heterophyidae, synopsis and new genus and new species, (46) 151.
- Heteroschema prima n.g. and n.sp., description, (41) 64.
- Heterospilus blackmanni n.sp., description, (41) 463.
- Heterospilus sp., notes, (44) U.S.D.A. 164.
- Heterosporium—
 gracile on freesia, (43) 243.
 phlei n.sp., description, (43) 752.
 syringae, notes, (46) 44.
- Heterostyly, treatise, (42) 224.
- Heterothallism and similar phenomena, (46) 529.
- Heterozygous, substitute for term, (43) 867.
- Hevea brasiliensis, *see* Rubber.
- Hewitt, C. G., writings of, (43) 449.
- Hexagona discopoda, notes, (50) 42.
- Hexamethylenamin, therapeutic efficiency, (47) 80.
- Hexamethylentetramin, nitrogen action of, (49) 123.
- Hexoses, fermentation, (48) 108.
- Hibiscus—
 mealybug, life history, (47) 851.
 mealybug, studies, (48) 552.
 ornamental, breeding, (49) 238.
 sabdariiffa, studies, (42) Guam 37.
- Hickories, time for transplanting, (43) Mo. 142.
- Hickory—
 borer, painted, summary, (46) N.Y. Cornell 249.
 circulio, life history, (47) U.S.D.A. 556.
 grafting, (44) 238.
 nuts, varieties, (41) 837.
 nuts, vitamin content, (44) 461.
 nuts, Zorn, studies, (45) 643.
 shagbark, grafting, (42) 737.
 shellbark, analyses, (48) 416.
 use for paving, (44) 285.
- Hidari irava, studies, (41) 757.
- Hides—*see also* Skins.
 and skins, (50) 293.
 and skins, country, (41) U.S.D.A. 672.
 and skins, disinfection, (43) 180; (49) 379.
 and skins, Indian, statistics, (42) 170.
 and skins, trade in India, (44) 573.
 anthrax infection in, control, (44) 877.
 imported from French Colonies, (42) 264.
 in England, nematode injury to, (47) 181.
 international trade, (46) 675.
 market for, (43) U.S.D.A. 595.
 of water buffalo for loom pickers, (47) 670.
 role in transmission of rinderpest disease, (48) 179.
 skinning and tanning, (44) Wash. 751.
 unhairing, test of lime for, (46) 114.
- Hieracium pratense—
 control, (44) Pa. 737.
 eradication, (42) Va. 439.
- Hieroglyphus furcifer (H. banian) on rice, (42) 451.
- High school, *see* Schools.
- Highway—
 bridges, loads for, (41) 583.
 development, survey, (44) 285.
 engineering, handbook, (42) 279, 890.
 Officials' Convention, (44) U.S.D.A. 785.
 research, (46) U.S.D.A. 86.
 research—
 at Pittsburg, California, (50) 484.
 in Illinois, (50) 790.
 national program for, (43) U.S.D.A. 387.
 outline, (44) U.S.D.A. 586.
 projects, apparatus used in, (50) 386.
 projects in United States, (49) 184.
 relation to road construction, (50) 789.
 results, (47) 289.
 situation in United States, (43) U.S.D.A. 186.
 transport, economics; conference, (49) 83.
 transportation, theory, (43) 790.
 *transportation, treatise, (50) 88.
- Highways, *see* Roads.
- Hippeastrum mosaic, ameoboid bodies in, (46) 743.
- Hippiscus olancha n.sp., notes, (45) 254.
- Hippodamia—
 convergens for aphid control, (41) 62
 North American species, (42) 158.
 spp., notes, (43) U.S.D.A. 455.
- Hippuric acid—
 fertilizing value, (45) 520.
 hydrolysis, (47) 484.
- Histamin, antineuritic action, (49) 261.
- Histidin—
 determination, (44) 801.
 effect on starch hydrolysis, (46) 708.
 Knoop's test for, (48) 413.
 oxidation from ox blood, (48) 313.
- Histiogaster entomophagus in grain, (44) 851.
- Histogenesis, dynamics of, studies, (44) 264, 265; (46) 262.
- Histological sections, mineralization, technique, (49) 408.
- Histology, textbook, (44) 577.
- Histology, vegetable, elements, (46) 322.
- Histomonas meleagridis, notes, (47) 487.
- Histomonas meleagridis, studies, (43) 476.
- History exhibition, village, value, (47) 897.
- Hitches—
 analyses, (42) 186.
 and equalizers for agricultural machines, description, (42) 283.
 horse, multiple, design, (42) 686.

Hodotermes pretoriensis, notes, (42) 180.

Hog cholera—

- and immature corn, (44) Mo. 781.
- antiserum and virus, distribution, (50) Minn. 181.
- antiserum, *Bacillus botulinus* in, (47) 487.
- antiserum, clarified, (45) 585.
- antiserum, production, (44) Kans. 280; (45) Ind. 177.
- antiserum production, value of tissue extracts in, (46) 183.
- antiserum, relation to botulism, (47) 387.
- bacilli in man, (43) 685.
- bacilli, mutation in, (49) 884; (50) 788.
- bacteriological study, (43) Ind. 385.
- blood, bacteria in, (43) 884.
- chronic, treatment, (41) 287.
- comparison with swine plague, (42) 381.
- control, (41) 577, U.S.D.A. 684, 777, 784, 879; (42) 679, 776, 877; (43) 272, U.S.D.A. 474, 780, 787; (45) 177, 680, 881; (49) 178, 179; (50) 883.
- control in Massachusetts, (46) 681.
- defibrinated blood antitoxin, clarification, (47) 85.
- diagnosis, (43) 780.
- discussion, (44) 79.
- dissemination by insects, (41) 578, 777.
- etiology and control, (44) 583.
- exposure experiments, (49) Ind. 580.
- form in British East Africa, (46) 778.
- immune serum, desiccation, (46) 884.
- immunity and transmission of tuberculosis, (46) Mo. 379.
- immunity, duration, (43) 184.
- immunity, testing, (45) 584.
- immunization, (41) 286, 577; (50) Minn. 182.
- immunization—
 - after-treatment, (47) 86.
 - and botulism, (46) 379.
 - of young pigs, (41) 86; (49) 481.
 - sequels, (48) 380.
 - troubles encountered, (49) 481.
 - value, (44) 683.
- in Arizona, summary of information, (44) 781.
- in Canada, (47) 181.
- in garbage-fed pigs, immunization, (42) Calif. 884.
- in Great Britain, (50) 182.
- in India, control, (47) 878.
- in North Dakota, (47) 878.
- in Wisconsin, (41) 474; (42) 878; (45) 781.
- incubation period, (47) 789.
- infection experiments, (45) Ind. 176.
- lesions, (44) Minn. 778.
- losses, (43) U.S.D.A. 471.
- medicinal remedies, so-called, (41) Ind. 87.

Hog cholera—Continued.

- nomenclature, (44) 781.
 - notes, (41) 680, 873; (44) 180; (46) 773; (49) 278; (50) 582.
 - papers on, (45) 382, 781.
 - prevention, paper on, (42) 477.
 - relation to garbage feeding, (46) 874.
 - relation to necrobacillosis, (41) 87, 784.
 - serum, *Bacillus botulinus* in, (46) 379.
 - serum, cause of failure, (43) 278.
 - serum, centrifuge for, (42) Calif. 884.
 - serum, methods of bleeding for, (41) 879.
 - serum production, (43) Ind. 385.
 - serum production and use, (42) 571.
 - serum, purification and concentration, (42) 570.
 - studies, (46) Mass. 81; (48) N.Dak. 86; (50) 382.
 - susceptibility of young pigs, (45) 584.
 - transmission, (47) Ind. 185.
 - transmission by fowls, (50) 382.
 - transmission, modes of, (42) 877.
 - treatise, (48) 181.
 - treatment, (47) Ill. 684.
 - v. hemorrhagic septicemia, (43) 683.
 - vaccination, balancing serum and virus, (43) 884.
 - vaccination, "cholera breaks" after, (50) 481.
 - virus—
 - dialysis, attenuation, and dilution experiments, (45) N.Dak. 285.
 - longevity, (42) 381; (44) Minn. 778.
 - nature of, (47) 186.
 - number of days virulent, (43) Ind. 384.
 - passage through foreign species, (43) N.Dak. 385.
 - review of literature, (49) 787.
- Hog—
- crate, construction, (42) U.S.D.A. 390.
 - fat, composition, (42) Okla. 267.
 - feeds, analyses, (45) 872; (46) Can. 168, Mich. 168.
 - houses—
 - and equipment, (46) Iowa 386.
 - construction, (45) Ind. 186.
 - design, in relation to sunshine, (43) 790.
 - for Indiana, (41) 586.
 - for South Dakota, plans, (42) 489.
 - plans, (47) Nebr. 191.
 - sanitation for, (45) Iowa 791.
 - sunshine efficiency, (46) 99, 891.
 - ventilation, importance of heat in, (44) 888.
 - louse, biology and histology, (46) N.Y.Cornell 853.
 - louse, control and eradication, (43) U.S.D.A. 688.
 - louse, control in Alabama, (42) 776.
 - mange, control and eradication, (43) U.S.D.A. 688.

Hog—Continued.

- prices in last 11 years, (44) U.S.D.A. 894.
 Hogging down alfalfa and clover, (46) S.C. 768.
 Hogging down experiments, (43) Ky. 871.
 Hogs, *see* Pigs.
 Holcocera confamulella n.sp., description, (45) 156.
 Hollong timber, notes, (42) 840.
 Holly berries as coffee substitute, (42) 415.
 Hollyhock—
 rust and mycoplasma theory, (43) 444.
 rust, notes, (44) 48; (50) 150, 250.
 seed and oil, composition, (46) 11.
 Hollyhocks, insect pest, (41) 257.
 Holotrichia leucophthalma on rubber, (46) 461.
 Homalinotus coriaceus, notes, (48) 856.
 Homalium, new species, description, (42) 224.
 Homalotylus mundus, parasitism by, (45) 663.
 Homalotylus n.spp., description, (42) 656.
 Home—

- building, treatise, (47) 688.
 colonization in Switzerland, (45) 493.
 demonstration—
 programs, value, (48) 192.
 work, (44) U.S.D.A. 697; (46) 94, 393.
 work, improving, (49) 492.
 work in Wyoming, (49) 297.
 work, status and results, (50) U.S.D.A. 95.
 economics—*see also* Household.
 and agriculture, cooperative extension, (49) U.S.D.A. 494.
 and international relations, (49) 897.
 Association, extension section. (46) 792.
 Association, proceedings, (48) 192.
 at experiment stations, editorial, (46) 601.
 bibliography, (42) 196; (50) 695.
 child care in, practice house, (44) 597.
 clothing selection, (43) 495.
 conference of Southern States, (45) 197.
 economics course—
 account keeping in, (43) 495.
 child training in, (43) 494.
 for foreign girls in California, (49) 797.
 for State-aided high schools, (43) 493.
 in household physics, (43) 495.
 in mechanics, (43) 495.
 of study, (42) La. 196; (44) 393.
 of study in Vermont, (50) 496.
 economics, courses, (41) 395, 396, 595; (42) 364; (43) 196, 296, 297, 396, 696, 697.

Home—Continued.

- economics courses—
 for extension workers, (49) 596.
 for junior high schools, (44) 698.
 for teacher training, (50) 395.
 in colleges, comparison, (44) 392.
 in Texas, (44) 392.
 economics departments, self-supporting, (48) 296.
 economics education, (47) 494.
 economics education—
 administration, (44) 597.
 administration course at Harvard University, (46) 799.
 for Virginia, (44) 296.
 in Indiana, (44) 794.
 in Norway, (48) 496.
 International Congress, (50) 796.
 international organization for, (49) 897.
 papers on, (48) 192.
 progress in, (49) 695.
 status, (48) 96.
 economics—
 elementary, textbook, (45) 399; (46) 296.
 exhibits, (45) Ill. 799.
 experiment stations, (43) 395.
 extension, cooperative, U.S.D.A. (44) 792; (47) 496.
 extension, educational tours, (44) 495.
 extension work, (41) N.J. 95, U.S.D.A. 198; (42) U.S.D.A. 396, N.J. 897; (46) Ill. 597.
 for farmers' daughters, (44) 698.
 government publications pertaining to, (49) 395.
 handbook, Illinois, (50) 94.
 home projects in, (43) 97, 798; (46) 296.
 in college and university, (44) 896.
 in high schools of Mississippi, (42) 396.
 in Idaho, (45) 599.
 in Idaho, evening courses, (45) 93.
 in negro schools, course of study, (45) 93.
 in negro schools, home-making courses in, (50) 597.
 in negro teacher-training institutions, (50) 495.
 in United States, (48) U.S.D.A. 895.
 economics instruction—
 arrangement of kitchen, (43) 598.
 coordinating with home life, (46) 792.
 home project work in, (50) 395.
 in Argentina, (42) 199, 294.
 in Belgium, (42) 699; (44) 695.
 in California, (41) 392.
 in Canada, (41) 391.
 in Constantinople, (42) 699.

Home—Continued.

economics instruction—continued.

- in evening and part-time schools, (44) 696, 698.
- in France, (41) 796.
- in French West Africa, (43) 296.
- in Gary, Indiana, (41) 391.
- in Illinois, (43) 695.
- in Louisiana, (42) 596.
- in New Jersey, (43) 796.
- in New Mexico, (41) 396.
- in 1918-19, (42) 792.
- in Tennessee, (42) 396.
- in Wisconsin, (44) 294.
- in women's colleges, (42) 293.
- need for, (42) 292.
- organization and administration, (41) 494; (48) 296.
- practice house v. home, (50) 95.
- practice houses, (44) 597.
- problems, (48) 393.
- standards of accomplishment, (50) 395.

statistics, (44) 793.

use of tests and measurements, (49) 798.

economics—

- lessons for rural schools, (41) 494.
- manuals, (41) 96, 97, 98.
- methods courses, textbook, (47) 897.
- natural sciences as basis, (46) 792.
- objectives in elementary schools, (50) 796.
- papers on, (50) 896.
- practice teaching in, (50) 94.
- project method in, (46) 296, 497; (49) 194.
- relation to high school program, (49) 96.
- requirements for Idaho schools, (43) 298.
- research in, (44) 597; (49) 596, 710.
- research in United States, (48) 256.
- research problem, (48) 159.
- research projects, (43) 595.
- research, standards, (49) 492.
- schools in Massachusetts, (43) 494.
- schools, teaching house design and construction, (45) 186.
- special methods course in, (47) 599.
- staff, relation to extension specialist, (49) 492.
- survey of progress, (42) 598.
- syllabus, (41) 494.
- teachers and supervisors, training, (48) 599.
- teachers, state schools for in Norway, (48) 496; (50) 94.

Home—Continued.

economics—continued.

- teachers, training, (42) 295, 297, 298, 395, 396, 692, 793; (43) 596, 696, 697; (44) 696.
- teachers, training in California, (48) 599.
- teaching in continuation schools, (48) 897.
- teaching in high schools, equipment, (48) 896.
- textbook, (41) 97, 396, 896; (43) 798; (45) 697; (46) 792; (50) 797.
- treatise, (42) 92.
- vocational education in, (50) 796.
- vocational instruction, practice houses in, (49) 797.
- vocational program for colored population, (49) 194.
- work in Spain, (50) 599.
- work, modern equipment for, (49) 97.
- education, (47) 494.
- gardens, (43) Ind. 395.
- gardens, papers on, (45) 398.
- grounds, beautifying, (42) 738; (50) Colo. 645.
- grounds in Wisconsin, planting, (41) 242.
- makers, training school for, (50) 297
- making—
 - classes, unit instruction sheets for, (48) 897.
 - courses in New Zealand, (49) 95.
 - education in evening schools, (48) 897.
 - in part-time schools of New York, (50) 695.
 - instruction in New York State, (48) 794.
 - instruction, projects, (46) 296.
 - on the farm, (49) 190.
- management schools for rural women, (44) 695.
- mechanical devices in, (48) 889.
- project work in Indiana, (41) 495; (43) 195.
- project work in Utah, (44) 194.
- project work, measuring results, (48) 296.
- projects, book on, (41) 395.
- projects, educational value, (44) 297, 898.
- projects in agriculture, (42) 91, 195.
- projects in home economics, (43) 97, 798; (46) 296, 497.

Homes—

- modern, plans, (42) 285.
- rural, construction, paper on, (48) 198.

Homestead laws, Texas, address, (42) 291.

Homing instinct in *Sphex vulgaris*, (42) 860.

Hominy—

- analyses, (46) N.H. 675.

Hominy—Continued.

- feed analyses, (41) N.H. 68, Conn. State 176, Ind. 564, R.I. 564, Can. 565, Ind. 868, N.Y.State 868; (42) Mich. 63, 263, 560, Ind. 769, N.H. 769, Tex. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, Vt. 464, N.J. 672, R.I. 672, 867, Ind. 867; (44) Ohio 178, 267, Mich. 568, Mass. 671; (45) Tex. 68, N.Y.State 469, N.J. 775, 872, Vt. 872; (46) Mich. 168, Tex. 675; (47) N.Y.State 172, Mass. 274, 275, Ind. 473, N.J. 570, R.I. 571; (48) 68, Me. 68.
- feed and hominy hearts, (41) 564.
- feed, composition and retail price, Conn.State (44) 176; (45) 375; (47) 570.
- feed, feeding value, (42) Kans. 372.
- feed for lambs, (41) Ind. 70, Nebr. 770.
- feed for pigs, (41) 675; (44) Ohio 177, Del. 366.
- feed for steers, (41) 367.
- feed v. corn for fattening pigs, (43) Mo. 772.
- lye, discoloration and manufacture, (47) 718.
- meal, analyses, (47) Ind. 473.
- Homoesoma nebuella on sunflower, (46) 51, 459.
- Homona coffearia—
notes, (44) 851.
on tea, (47) 658.
studies, (41) 357.
- Homoporus chalcidiphagus—
life history studies, (45) 460.
notes, (45) Mich. 252.
- Homoptera on Cranberry Lake, (50) 453.
- Homozygous, substitute for term, (43) 867.
- Honey—
absorption of hydrocyanic acid by, (49) U.S.D.A. 457.
American, color and composition, (50) 196.
analyses, (45) Tex. 161.
and honeycomb, vitamin content, (45) 365, 665.
antiscorbutic value, (44) 63.
aroma, preparation, (42) 552.
artificial—
analysis, (47) 808.
examination, (46) 507.
preparation, (42) 58, 552.
standard, (46) 416.
as carrier of intestinal diseases, (43) Colo. 163.
clover, production, (45) Can. 859.
cost of production, (47) 659.
eucalypts as source, (47) 443.
flow conditions in 1922, (49) Iowa 757.
from cotton plant, (46) 160.
Hubam clover as source, (47) Ohio 137, Okla. 856.
industry, place of wood in, (44) 356.
invertin in, (43) 314.

Honey—Continued.

- larva feeding on, (43) 558.
- locust beans, chemical and structural study, (50) U.S.D.A. 501.
- melezitose crystals in, (42) 311.
- methods of investigations and standards, (41) 558.
- paper container, (41) Can. 556.
- plants, American, (43) 259.
- powder, preparation, (42) 552.
- prices, July, 1920, (43) U.S.D.A. 695.
- production, (41) U.S.D.A. 463; (43) Can. 762; (44) Iowa 452; (48) Ariz. 457.
- production, effect of hybridization on, (46) 51.
- production in California, (46) 159.
- protein determination in, (49) 804.
- uses in health and disease, (43) 57.
- Honeybees, *see* Bees.
- Honey-dew honeys, melezitose in, (41) 799.
- Honey-dew melons, history and composition, (45) 741.
- Honeysuckle—
as affected by leaf miner, (42) 250.
Tartarian, culture, (49) Alaska 435.
- Hoof meal, effect on soil acidity, (47) R.I. 519.
- Hookworm—
control, (45) 286, 484.
disease, bibliography, (48) 151.
disease, treatment, (48) 486.
- Hookworms—
carbon tetrachlorid for, (46) 282; (47) 483, 589.
control, (41) 480, 782; (49) 76; (50) 380, 684.
extracts, experiments, (46) 379.
in dogs, treatment, (46) 686.
in foxes, remedies, (46) 184, 185, 886.
in man, control, (48) 151.
in swine, key, (49) 182.
pharynx and alimentary canal, (50) 160.
treatment with distol, (46) 684.
- Hop—
aphid, control, (47) Idaho 759.
aphid, dipterous enemy, (41) 455.
canker, cause, (49) 147.
club root, notes, (47) 45.
diseases in England and Wales, (49) 645.
mildew, treatment, (41) 751.
mold, control, (48) 145.
red spider, summary, (49) Oreg. 157.
refuse, feeding value, (42) 369.
- Hopea canarensis n.sp., description, (42) 142.
- Hopea odorata timber, properties and uses, (49) 43.
- Hopkins, C. G.—
biographical sketch, (41) 599.
memorial exercises for, (42) 1.
- Hopkins host selection principle, experiments, (46) 353.
- Hoplocampa cookei, control, (48) Calif. 551.

- Hoplocampa cookei*, notes, (47) 257, 557, Calif. 654.
- Hoplocerambyx* and dying off of sal, (45) 662.
- Hoplopleura*, new species and subspecies, (46) 246.
- Hopperburn, artificial production, (47) 850.
- Hopperburn in Vermont, (49) 555.
- Hopperdozer for control of cucumber beetle, (46) 856.
- Hops—
 fungus diseases, control, (49), 540.
 growing in South Africa, (41) 734.
 insects affecting, (41) N.Y.Cornell 160; (48) 152.
 mildew resistant, (43) 446; (44) 644; (45) 543; (48) 546.
 wild, seedlings, variation in, (48) 27.
- Hordein, analyses, (41) 11.
- Hordein and bynin, identity of, (42) 411.
- Hordeum—
 boreale as hay crop, (41) Alaska 31.
 jubatum, analyses, (41) Wyo. 333.
 jubatum, injury to sheep, (41) Nev. 782.
- Horistonotus uhleri*, see Wireworm.
- Hormodendron cladosporioides*—
 in cold storage meat, (48) 258.
 in sugar solution, studies, (46) 206.
 notes, (45) 381; (47) Calif. 648.
 on Brie cheese, (42) 877.
- Hormone, use of term, (42) 164.
- Hormones—
 and heredity, treatise, (47) 568.
 cell-division, in plants, (49) 219.
- Horn and hoof meal, nitrogen availability in, (47) Tex. 217.
- Horn fly—
 control, (49) 448.
 effect of food on longevity and reproduction, (50) 456.
 in Porto Rico, (44) 164; (45) 583, 857.
 in Porto Rico, summary of information, (42) 158.
 notes, (41) 755.
- Horn meal—
 bacterization, (42) 520.
 effect on lime requirements of soil, (44) Pa. 723.
 effect on soil acidity, (47) R.I. 519.
- Horn waste, utilization, (41) 723.
- Hornbeam—
 in Britain, (50) 838.
 oak, woods in Hertfordshire, (43) 241.
 seeds, delayed germination, (49) 141.
- Hornet, European, notes, (44) 352.
- Hornets and other wasps, (45) 762.
- Hornets, notes, (43) 52.
- Horns, method of preventing, (49) U.S.D.A. 875.
- Horns, transmission as sex-linked characters, (49) Idaho 268.
- Hornworm septicemia, (50) 845.
- Horse beans—
 analyses, (50) Oreg. 7.
- Horse beans—Continued.
 culture experiments, (49) Mont. 430.
 culture on peat soil, (43) 23.
- Horse—
 blood, diphtheria antitoxin in, (47) 680.
 blood, specific gravity and hemoglobin, index, (45) 483.
 bots, see Bots and *Gastrophilus*.
 disease, Kansas, in Colorado, (44) 280.
 disease, orchard, (43) 473.
 disease resembling forage poisoning, (45) Ind. 177.
 diseases—
 erythrocytes in, (47) 487.
 in Mississippi, (42) 381.
 of foot, (42) 571.
 summary, (48) 81.
 treatise, (47) 483.
 vaccine and serum therapy, (45) 385.
 fat, digestibility, (41) U.S.D.A. 65.
 feeds, composition and retail price, (47) Conn.State 570.
 labor, cost, (46) 784; (47) 275; (50) Can. 272.
 labor, efficiency of, (42) 95.
 labor v. tractors, (45) Ill. 86.
 mange, control, (43) 184, 272.
 mange cure, (47) 585.
 mange in Canada, (47) 181.
 mange in Great Britain, (46) 178.
 mange, parasitic, (41) 873.
 mange, sarcopic, treatment, (41) 880.
 meat, as human food, (41) 799.
 meat, detection, (42) 315; (49) 505.
 meat, digestibility, (44) 661.
 muscle, creatin content, (49) 613.
 muscle, diamino acid content, (47) 610.
 nettle, relation to tomato leaf spot, (45) 546.
 plague, notes, (41) 784.
 pox and coital exanthema, (46) 778.
 semen, H-ion concentration, (49) Kj 273.
 serum as affected by heat, (47) 86.
 serum for treatment of joint-ill, (42) 571.
 sickness—
 African, serum treatment, (41) 185.
 African, summary, (45) 888.
 antiserum, contamination by equine infectious anemia, (44) 81.
 in Belgian Kongo, (41) 879; (44) 781.
 sequel to, (44) 76.
 stables, construction in Mexico, (43) 290.
 v. tractor, time requirement for plowing, (45) 186.
- Horse-chestnut—
 leaves and twigs, feeding value, (45) 774.

Horse-chestnut—Continued.

- oil, analysis, (42) 115.
- twig blight, notes, (44) Pa. 746.

Horse-chestnuts—

- feeding value, (42) 769.
- use in bread making, (43) 64.

Horseflies—*see also* Tabanus.

- and cattle, summary, (47) Nev. 458.
- in Louisiana, (49) 657.

Horsehair, disinfection, practicability, (46) 281.

Horsehair, microscopic studies, (47) 81.

Horsehides, exports from Argentina, (43) 95.

Horsemint as source of thymol, (41) 825.

Horsepower on the farm, (43) U.S.D.A. 483; (47) 90.

Horse-radish—

- bacterial root rot, (50) 748.
- culture, (44) Wash. 338.
- culture experiments, (49) Alaska 435.
- diseases, notes, (41) 745.
- flea-beetle, control, N.J. (42) 849; (44) 350.
- nutritive value, (41) 557.
- preserving value, (42) 114.
- root rot, N.J. (46) 548; (48) 347.
- webworm, European, (45) U.S.D.A. 660.

Horses—

- Aleurobius farinae* on skin of, (42) 180.
- algae as substitute for oats, (43) 775.
- anatomy and physiology, atlas, (41) 87.
- anatomy, dissection guide, (49) 381.
- anatomy, regional, (41) 279.
- and asses, comparative osteology, (46) 875; (47) 868.
- and tractors on Corn Belt farms, relative adaptability, (48) U.S.D.A. 786.
- antirabic vaccination, (47) 82.
- as affected by arsenic, (44) 77.
- as affected by buckeye, (47) Ala.Col. 785.
- as affected by Sudan grass, (46) 678.
- bacterial flora of eyes, (43) 472.
- barley v. oats for, (44) Wis. 269.
- bibliography of, (43) 173.
- blood of, (41) 87; (42) 379; (49) 683.
- blood plasma, carbon dioxide in, (48) 778.
- blood pressure, (41) 287, 579.
- blood transfusion, donors, (47) 879.
- body measurements, (48) 572.
- breeding, (45) 876.
- breeding—
 - artificial insemination in Russia, (48) 873.
 - experiments, (44) U.S.D.A. 774; (48) 868.
 - genetics in relation to, (49) Ky. 273.
 - history in Palatinate Province, (49) 69.
 - in Canada, (46) 872.

Horses—Continued.

breeding—continued.

- in Catalonia, (47) 866.
- in France, (42) 375.
- in Germany, effect of war, (50) 575.
- in Great Britain, (42) 562.
- in Madagascar, (44) 267.
- in North Africa, (42) 560.
- breeds in Porto Rico, (47) 173.
- British breeds, (44) 364.
- broom corn seed for, (43) 671.
- cannon bone circumference, (44) 67.
- care and management, (48) 693.
- care in health and disease, (49) 377.
- cellulose as emergency feed for, (43) 170.
- color inheritance, (43) 378; (44) 269.
- corn silage for, (43) Ariz. 775.
- cost of keeping, (47) Mich. 175.
- cost on Corn Belt farms, (48) U.S.D.A. 890.
- cottonseed meal for, (44) U.S.D.A. 571.
- cutaneous surface, measure, (47) 576.
- cycles of production, (44) N.J. 364.
- danger of hyperimmunizing against swine erysipelas, (49) 482.
- design for multiple hitches, (42) 686.
- development in Yugoslavia, (50) 372.
- digestion experiments, (46) 68, Mass. 476; (47) 372.
- diphtheria antitoxin formation in, (48) 378.
- displacement by tractors, (43) U.S.D.A. 690.
- draft, feeding experiments, (46) Ill. 369; (50) 575.
- draft, judging, (44) 494.
- draft, management, (41) 370.
- draft, raising, (42) Okla. 561.
- dynamometer for testing, (50) 288.
- effect of asphyxiating gas on, (43) 82.
- entry in the studbook, (47) 377.
- farm, feeding, (44) Utah 773.
- farm prices, (41) U.S.D.A. 696.
- farm work, feeding, (49) 69.
- feed records, Can. (41) 570; (43) 775.
- feeding experiments, (41) Mass. 274, Mo. 675; (42) Guam 64; (43) 871; (45) Mo. 272, Can. 876; (46) Ill. 369, Ill. 677, U.S.D.A. 531; (47) N.C. 576; (50) 272.
- feeding, feed unit concept, (45) 373.
- feeding in Hawaii, (48) 169.
- for farm work, (48) Mo. 666.
- French, exportation for improvement, (47) 571.
- French-Canadian, breeding experiments and history, (44) Can. 269.
- glycogen and glucose in muscles, (49) 570.
- grading, indices and use in, (46) 573.
- growth of hoofs, (49) 683.
- heat production, (45) 490.

Horses—Continued.

- hereditary unsoundness in, (42) Okla. 561.
- heredity in, (45) 171.
- history, development, and uses, (50) 575.
- hygiene and diseases, (47) 884.
- immunization, (41) 376.
- immunization against anthrax, (50) 79.
- in China, (46) 573.
- in Europe, address, (43) Kans. 674.
- internal parasites of, (46) 885.
- international trade, (46) 675.
- intestinal parasites of, (46) 685.
- judging, (50) 174.
- judging and selecting, formulas, (47) 68.
- judging, treatise, (43) 697.
- length of life, (44) 866.
- limbs of, (44) 377.
- long bones as affected by infectious anemia, (43) 83.
- management, (50) 775.
- mineral supplements for, (44) Ohio 175.
- Morgan, breeding, (46) U.S.D.A. 369.
- multiple hitching, (47) 90.
- muzzle flora, (41) 287.
- nematode parasites of, key, (44) 781.
- oat straw for, (43) Mo. 775.
- oats-fed, calcium and phosphorus metabolism, (44) 672.
- parasite in ligamentum nuchae, (49) 178, 284.
- pasturing experiments, (43) Minn. 671.
- peracute disease in, bacteriologic studies, (42) 884.
- poisoning, (45) Nev. 782.
- poisoning by castor seed, (41) 87.
- poisoning by common bracken, (43) 471.
- poisoning by whorled milkweed, (43) U.S.D.A. 470.
- polydactylism in, (49) 165.
- popular articles on, (47) 866.
- production, (50) Kans. 71.
- pulling power, paper on, (50) 97.
- raising in colonies, (47) N.Y.Cornell 779.
- rough rice for, (45) La. 68.
- sarcosporidial cysts in, (44) 79.
- soy beans for, (50) Ill. 675.
- spermatogenesis, (43) 670.
- strongylid larvae in, (49) 256.
- strongylid parasites of, (46) 485.
- thorax and abdomen, topographical anatomy, (49) 787.
- thoroughbred, effect of inbreeding, (48) 171.
- treatise, (44) 185.
- type for Oklahoma, (42) Okla. 561.
- variation in percentage of blood corpuscles, (45) 385.
- velvet bean meal for, (44) Mass. 671.
- with capped knees, market value, (48) 272.

Horses—Continued.

- work, crushed v. whole oats for, (42) Wis. 375.
- zinc determination in, (45) 367.
- Horseshoe-crab blood as oxygen consumption indicator, (41) 524.
- Horseshoes of interest to veterinarians, (41) 82.
- Horsetail fern, eradication, (44) Oreg. 826.
- Horticultural—
 - agent, county, functions, (43) 643.
 - conditions in France, (43) 643.
 - development in past 75 years, (50) 299.
 - education in Netherlands, (43) 834.
 - exhibits, organization, (42) U.S.D.A. 346.
 - inspection, trend, (45) 253.
 - investigations, need of coordination, (43) 642.
 - laws of California, (43) 741.
 - libraries in United States, (41) 343.
 - problems, diversity of opinions, (43) 642.
 - products, Italian, commerce and trade in, (42) 238.
- Horticulture—
 - as a science, (47) 39.
 - course of study, (45) 93.
 - development in California, (46) 37.
 - experiment station research in, editorial, (49) 101.
 - extension problems, (43) 643.
 - for schools, textbook, (48) 693.
 - in Great Britain during the war, (44) 534.
 - outline for seasonal presentation, (42) 795.
 - schools in Norway, (45) 398.
 - teaching, (49) 194.
 - textbook, (41) 96, 597; (45) 93.
- Horticulturists, training for, (44) 493.
- Hose, hydraulic experiments with, (42) 79.
- Hospitals, dietary departments, management, (42) 365.
- Hot waves in United States, (49) 808.
- Hotbed practices, treatise, (42) 532.
- Hotbeds—
 - and coldframes, construction and use, (49) U.S.D.A. 833.
 - concrete, construction, (43) 90.
 - construction, (42) U.S.D.A. 299.
 - use of, treatise, (41) 538.
- Hotel—
 - country, cost accounting for, (45) 261.
 - dining room, country, costs, (47) 60.
 - employees, feeding, (45) 261.
- Hotels, country, improving, (49) 57.
- House fly—
 - as carrier of disease, (43) 558.
 - as carrier of fowl tapeworms, (41) 685, 881.
 - as carrier of habronemas, (47) 257.
 - attraction to ammonium carbonate, (48) 751.
 - bionomics of, (44) 552; (45) 857.

House fly—Continued.

- chemotropism in, (44) 458; (46) 460.
- control, (41) N.J. 58, 662; (50) 255.
- effect of food on longevity and reproduction, (50) 456.
- fecundity and longevity, (47) 361; (49) 156.
- flight distances, (41) 259.
- habits, (44) 753.
- Habronema muscae in, (48) 284.
- larvae, tolerance to creosote oil, (42) 453.
- life history and control, (44) 255.
- of Mesopotamia, (44) 760.
- overwintering, (48) 157.
- oviposition as affected by chemicals, (47) 56.
- oviposition, observations, (49) 254.
- parasite of, (42) 160.
- plague in American Expeditionary Force, (49) 853.
- relation to anthrax, (41) La. 461.
- relation to hog cholera, (41) 578.
- transmission of equine habronemiasis by, (48) 86.

Housecleaning, improved methods, (44) U.S.D.A. 889.

Household—see also Home economics.

- appliances, book on, (42) 285.
- arts for junior high schools, (46) 597.
- budget and accounts, teaching, (41) 494.
- chemistry, laboratory outline, (46) 296.
- devices, recipes, etc., (41) 699.
- engineering, guide, (42) 274.
- exhibits at fairs, score cards for, (47) 195.
- insects, control, (45) 552; (47) Ill. 453.
- labor-saving appliances, treatise, (41) 692.
- management instruction in Belgium, (49) 798.
- mechanics in Detroit schools, (45) 399, 496.
- physics, research problem in, (48) 159.
- thrift, lessons, (41) 66.
- work, increase in metabolism during, (42) 167.

Housekeeping—

- cooperative, reducing cost of living, (42) 364.
- in Holland, (47) 764.
- textbook, (43) 798.
- tropical, (47) 764.
- wholesale, (47) 60.

House-owner's book, (47) 688.

Houses—

- concrete, construction, (44) 588; (49) 87.
- construction to reduce heating costs, (49) 890.
- floors, unusual damage by wasps, (50) 664.
- heat losses through walls and roofs, (50) 389.
- heating methods, (49) 186.

Housework, energy expenditure during, (49) 65.

Howardula benigna, parasite of cucumber beetle, (46) 461.

Hoxie, S., life and contribution to cattle breeding, (49) 374.

Huanacu, domestication in Peru, (41) 869.

Hufenandia n.spp., descriptions, (41) 740, 741.

Humidity—

- and hot weather, (43) U.S.D.A. 718.
- and precipitation, (49) U.S.D.A. 313.
- conditions in residence heated by a warm-air furnace, (49) 185.
- effect of irrigation on, (42) 214.
- effect on bean seedlings, (47) 831.
- effect on bean weevil, (46) 661.
- effect on critical periods of plant growth, (43) 207.
- effect on moisture determination in leather, (46) 205.
- effect on testing cotton materials, (50) 234.
- indoor and outdoor, (44) U.S.D.A. 717.
- relative, and forest fires, (50) U.S.D.A. 743.
- requirements for residences, (48) 786.

Humidor, description, (44) 55.

Humification, colorimetric studies, (47) 319.

Humins—

- acids, chemistry and physics of, (43) 213, 321.
- formation, (44) 501.
- formation in protein hydrolysis, (49) 11.
- nitrogen of protein hydrolysis, (43) 110, 111.

Humming birds—

- keeping in captivity, (41) 56.
- synopsis and catalogue, (46) 555.

Humogen—

- bacterization, (42) 520.
- fertilizing value, (44) 128.

Humus—

- accumulation in soil, limits, (50) 815.
- acid, effect on nitrogen fixation, (46) 715.
- acid pine forest, fertilizing value, (47) 815.
- acids, effect on assimilation of phosphoric acid, (47) 322.
- acids, effect on coagulation of clay, (43) 515.
- carbolineum as soil disinfectant, (45) 727.
- carbolineum effect on action of calcium cyanamid, (44) 817.
- carbon determination in, (50) 202.
- carbon, use to prevent nitrogen loss from manure, (44) 817.
- collection and utilization in New Jersey, (42) 514.
- colorimetric studies, (47) 319.
- content of St. Joseph Co. soils, (49) Mich. 16.
- decomposition, (47) 813.

Humus—Continued.

- determination, (41) 803; (48) 110.
- determination in soils, (50) 202.
- effect on chemical reactions in soil, (41) 720.
- effect on nitrogen fixation, (50) 120.
- effect on nitrogen fixation in presence of boric acid, (48) 817.
- effect on tree and wheat growth, (47) 120.
- extracts, ultramicroscopic microbes in, (48) 619.
- fertilizers, studies, (41) 722.
- formation, (45) 809.
- formation and composition, (47) Iowa 724.
- formation from green manures, (44) R.I. 22.
- formation, importance of Enchytraeiden in, (44) 126.
- formation in soils, (43) 213.
- forming plants, H-ion concentration, (41) 19.
- investigations, (46) Iowa 317.
- lime soils, transformation, (47) 19.
- nature of, (48) 119.
- nitrate formation in, (41) 125.
- poor soils of Sweden, classification, (41) 510.
- raw, fertilization, (48) 22.
- soils, aqueous solutions, hysteresis, (49) 812.
- soils, decomposition of neutral salts by, (50) 514.
- soils, mechanical analysis, (49) 316.
- soils of Sweden, classification, (41) 511.
- soils, phosphoric acid in, (46) 715.
- Hunger-osteomalacia in Vienna, (46) 568.
- Hunt, T. F., biographical sketch, (49) 4.
- Hunting, notes, (41) 743.
- Huntley Reclamation Project Experiment Farm work, (49) U.S.D.A. 898.
- Hurricanes, relation to storm tides, (48) U.S.D.A. 511.
- Hyacinth bean, specific names, (41) 523.
- Hyacinths—
 - failure of bulbs, (42) 50.
 - varieties, (42) U.S.D.A. 346.
- Hyacinthus orientalis*—
 - heteroploid varieties, (49) 822.
 - periodicity of, (43) 729.
- Hyalomma aegyptium*, notes, (43) 83.
- Hyalopeplus smaragdinus*—
 - n.sp., description, (41) 847.
 - notes, (44) 851.
- Hyalopterus arundinis*, studies, (41) U.S. D.A. 163.
- Hyalopus yvonis*, notes, (47) 547.
- Hybrid animals, sex ratio and unisexual sterility in, (48) 766.
- Hybridization—*see also* Breeding, Animal breeding, Plant breeding, and specific animals and plants.
 - and apogamy in composites, (48) 729.
 - and behavior, (49) 568.
 - asexual, through grafting, (41) 522.

Hybridization—Continued.

- cause of apogamy in plants, (42) 527.
- evolution by, (41) 223.
- experiments with barley, (46) 531.
- experiments with *Nicotiana*, (42) 332.
- experiments with peas and beans, (46) 430.
- in iris, (45) 744.
- in tobacco, (47) Calif. 635.
- increased development from, hypothesis, (41) 747.
- natural, in rice, (49) 633.
- natural, of wheat and rye, (48) 735.
- of forest trees, (44) 46.
- of pheasants and Golden Campines, (41) 472.
- of *Salix*, (48) 729.
- of spontaneous variants, (46) 430.
- plant, experiments, (43) 535.
- studies, (44) 668.
- studies with potatoes, (46) 834, 835.
- Hybrids—
 - and mutants, (48) 829.
 - partial sterility in, (49) 25.
 - sterile, in birds, (47) 374.
 - subspecific, in deer mice, (50) 822.
 - twin and constant in *Drosophila*, (41) 867.
- Hydathodes—
 - and stomata in *Campanula*, (46) 523.
 - nature and reaction of water from, (49) N.Y.Cornell 520.
- Hydnocarpus* oil, chemistry, (47) U.S.D.A. 241.
- Hydnum* sp. on blazed trees, (46) 151.
- Hydrangea—
 - chlorosis, (44) Conn.State 150.
 - flowers, color regulation, (50) 300.
 - sp., propagating in acid medium, (49) 836.
- Hydrangeas, lime studies with, (48) 140.
- Hydration and growth, studies, (43) 428; (45) 627.
- Hydration, factors affecting, (48) 824.
- Hydraulic—
 - diagrams for discharge of conduits and canals, (48) 486.
 - dredge pipe, velocity tests in, (44) 685.
 - engineering. fundamental basis of, (42) 571.
 - equipment experiments, (42) 79.
 - fills, determining pressures, (41) 582.
 - formula, Manning, diagram for solving, (43) 477; (44) 283.
 - jump and critical depth, (44) 584.
 - jump, studies, (42) 181.
 - ram, design and installation, (50) 789.
 - rams, operation, (42) 390.
 - tables, (44) 482.
 - works, influence on Dutch agriculture, (42) 183.
- Hydraulics, treatise, (42) 274, 572; (45) 889; (48) 183.
- Hydrocarbons, nonbenzenoid, chemistry, (47) 608.

Hydrochloric acid—

determination in gastric juice, (44) 505.

from munition plants, effect on conifers, (43) 347.

in chick feed, value, (45) Ind. 172.

production from chlorin and water, (43) 712.

titration curves for, (48) 710.

Hydrocyanic acid—

absorption and retention by fumigated food products, (49) U.S.D.A. 456.

determination in beans, (42) 7; (43) 610.

determination methods, (42) 414, 610.

effect on plants, (44) 223.

for citrus fumigation, (42) 250.

for daylight fumigation, (42) 242.

for mosquito control, (44) 354.

for root knot nematode, (42) 243.

for seed treatment, (45) 29.

for traubenwickler, paper on, (42) 152.

formation in plants, (46) 630.

gas, diffusion, (48) Calif. 551.

gas, distribution in fumigation, (47) N.J. 51.

gas, effect on green plants, (42) 529.

gas for insect control, (45) 656.

gas fumigation, (44) 754.

gas fumigation, history, (50) 657.

gas fumigation in California, (48) 152.

gas fumigation in greenhouses, (47) 847; (48) 851.

gas fumigation, resistance of scale insects to, (48) 750.

gas, generation and use, (44) 57.

gas, insecticidal value, (44) Mo. 856; (48) Ky. 357.

gas treatment for citrus, (44) U.S.D.A. 250.

gas, use against red scale, (44) Calif. 751.

in Burma beans, (41) 633.

in *Cystopteris alpina*, (41) 633.

in plants, synthesis, (50) 224.

in sorghums, (45) 41.

in Sudan grass, (46) 179.

in Sudan grass, effect on cattle, (45) 179.

injury to plants, (46) 641.

insecticidal value, (44) U.S.D.A. 56.

liquid, for fumigation, (41) 164, Calif. 550, 551, 754, 757.

liquid, properties, Calif. (41) 502; (42) 848.

use against vine moths, (45) 555.

use of, paper on, (42) 152.

v. potassium cyanid, (50) 151.

Hydroelectric power systems of California, (49) 383.

Hydrogen—

and nitrogen mixture, preparation, (43) 220.

carbon monoxid determination in, (41) 312.

Hydrogen—Continued.

electrode—

apparatus, (45) 715.

bubbling, (47) 609.

description, (42) 412.

new cell, description, (43) 612.

vessel and soil measurements, (47) 609.

vessel, Clark, modification, (48) 10.

generator, description, (42) 8, 312.

generator for measuring hydrogen-ion concentration, (47) 713.

peroxid—

action on flour, (44) 612.

action on organic matter, (47) 713.

bactericidal effect on tetanus spores, (44) 780.

catalytic decomposition, (41) 409.

decomposition, (49) 418.

decomposition in pasteurized milk, (43) 206; (44) 205.

disinfecting power, (43) 78.

effect on keeping quality of milk, (47) 676.

reaction with carbon dioxid in soils, (41) 720.

sulphid, determination in sewage, (42) 207.

sulphid evolved from cooked foods, determination, (47) 806.

sulphid production, relation to sulphur bacteria, (44) 133.

Hydrogenation—

catalytic, treatise, (41) 310.

effect on vitamin content of oils, (46) 565.

Hydrogen-ion concentration—

and measurement, principles, (47) 712. and potato scab, (48) Can. 48.

apparatus for determining, (47) 109, 204.

colorimetric determination, (44) 411; (48) 412; (49) 803.

control, buffered salt solution for, (46) 804.

determination, (41) 11, 503; (45) 11, 205, 313, 411; (46) 614, 804; (49) 202.

determination, apparatus and technique, (49) N.Y. Cornell 712.

determination for milk grading, (42) Mich. 613; (43) 615.

determination in plant juices, (42) 728.

determination in sweat, (42) 465.

determination, methods, (42) 229, 313; (48) 208.

determination, new types of electrodes, (47) 713.

determination, refinements in indicator method, (45) 334.

effect on—

activation of pepsin, (43) 611.

Hydrogen-ion concentration—Continued.
effect on—continued.

- adsorption of plant food by soil colloids, (49) 17.
- amount of pepsin, (42) 204.
- amylase activation, (46) 325.
- Azotobacter, (48) 19.
- bacterial types in intestines, (49) 561.
- calcium determination, (47) 109.
- growth and nitrogen fixation of Azotobacter, (49) 722.
- growth of seedlings, (48) Del. 26.
- mosquitoes, (46) 660.
- nitrogen fixation, (48) 719.
- seed germination and growth, (43) 524.
- tetanus bacilli, (46) 683.
- for determining changes in milk, (46) Mich. 479.
- for precipitation of iron, (44) 801.
- in bacterial cultures, factors affecting, (42) 474.
- in nutrient solutions, factors affecting rate of change, N.J. (48) 326, 327.
- in potato wart tissue, (45) 650; (47) 354.
- measurement, (46) 110.
- measurement in biological media, (49) 110.
- measurements, hydrogen generator for, (47) 713.
- measuring buffer effect, (48) 805.
- of bacterial cultures, (43) 383.
- of blood as affected by high altitudes, (43) 565.
- of broth media, variations in, (45) 503.
- of cane juice, effect on decolorization, (46) 508.
- of Carmel Valley soils, (46) 26.
- of culture media, (44) 410.
- of culture media, variations in, (43) 381.
- of drained marsh soils, (47) 513.
- of drops of fluid, determination, (45) 503.
- of fluids for intravenous medication, (47) 203.
- of human feces, (48) 62.
- of Indian soils and plant juices, (48) 811.
- of intestinal contents, (47) 264.
- of media, change during heating, (46) 413.
- of nutrient solutions, (44) 621.
- of nutrient solutions as affected by wheat seedlings, (49) 627.
- of nutrient solutions, relation to wheat growth, (47) 729.
- of potato dextrose agar, (49) 821.
- of rice soil, (48) 214.
- of small intestines, (44) 666.
- of soil—
 - as affected by drying, (47) 619, 713.

Hydrogen-ion concentration—Continued.
of soil—continued.

- as affected by fertilizers, (43) 423.
- as affected by sulphur, (46) 428.
- colorimetric determinations, (43) 211.
- determination, (49) 309.
- effect on potato scab, (48) 212.
- effect on wheat seedling blight, (47) 246.
- factors affecting, (48) 514.
- relation to lime requirement, (43) 421, 515; (46) 812.
- relation to plant distribution, (46) 432, 525; (48) 515.
- significance to plants, (49) 618.
- of solutions containing carbon dioxide, determination, (48) 10.
- of solutions, salt effects on value, (43) 313.
- of solutions sterilized in soft and hard glassware, (48) Mich. 204.
- of urine, determination, (47) 716.
- of water, relation to carbon dioxide content, (44) 482.
- of wheat plant juice, (49) 245.
- optimum for microorganisms, (48) 312.
- regulation, use of buffers, (47) 203.
- relation to tumor tissues, (45) 647.
- relation to wheat scab, (50) 44.
- theoretical foundations, (48) 412.
- theory and application, (47) 203.
- value as affected by irrigation water, (42) 119.
- value of soils, variation, (48) 215.
- variation in fresh milk, (43) N.Y.State 578.
- voltage conversion tables and bibliography, (41) 204.
- Hydrographic surveys in New Mexico, (42) 572.
- Hydrologic service of Peru, activities, (42) 384.
- Hydrology, ground-water, outline, (50) 83.
- Hydrology, treatise, (42) 681.
- Hydrometric data in Washington, summary, (50) 789.
- Hydrophobia, *see* Rabies.
- Hydrotaea dentipes, Empusa disease in, (42) 361.
- β -hydroxyglutamic acid, synthesis, (43) 111.
- Hydroxyglutaminic acid, yield from prolin, (42) 201.
- Hygiene—
 - and preventive medicine, treatise, (46) 859.
 - home and community, textbook, (50) 797.
 - veterinary, treatise, (46) 178.
- Hygrometrical tables, (41) 808.
- Hygroscopicity, effect of soil reaction, (50) 618.
- Hygroscopicity of soil, (46) 810.
- Hylastes angustatus in pine plantations, (47) 551.
- Hylastes ater, notes, (46) 558.

- Hylecoetus dermestoides*, notes, (47) 258.
Hylemyia—
antiqua, *see* Onion maggot.
brassicæ, *see* Cabbage maggot.
cerealis, notes, (41) Mont. 57.
cilicrura, *see* Seedcorn maggot.
coarctata, notes, (41) 847.
nicola n.sp. attacking nestling birds, (44) 553.
strigosa, chemotropic response, (43) 554.
trichodactyla, notes, (47) 56; (49) 848.
Hyletastes missouriensis, (44) 356.
Hylobius abietis, notes, (44) 356; (49) 50.
Hylobius pales, life history and control, (46) 253.
Hylocurus parkinsoniae n.sp., description, (50) 453.
Hylocurus, revisional notes, (50) 453.
Hyoliris, new genus, description, (42) 550.
Hylophytes, habitats, (44) 820.
Hylopterus arundinis in South Dakota, (41) 59.
Hylurgops pinifex, notes, (41) 758.
Hymenochaete noxia, notes, (42) 145, 542; (47) 50, 754; (48) 45.
Hymenochaete, studies, (42) 147.
Hymenolepis—
carioca, life history, (41) 881.
carioca, notes, (43) Okla. 79.
spp., notes, (44) 379.
Hymenoptera—
entomophagus parasitism in, (43) 457.
female reproductive organs in, (49) 50.
Indian, parasitic, (42) 362.
key, (44) 451.
new forms, (45) 459.
new species, descriptions, (43) 259.
North American, new species, (43) 857.
notes, (45) 251.
of Minnesota, (41) 57.
parasitic, (47) 358, 659; (49) 50.
parasitic, new, (41) 63, 463; (48) 59.
studies, (45) 763.
Hyostrongylus, new genus, erection, (46) 151; (47) 846.
Hypena humuli, studies, (41) N.Y.Cornell 161.
Hypenidium polyfasciatum n.sp., description, (42) 653.
Hypera nigrirostris in Northwest, (42) 857.
Hypera punctata, *see* Clover leaf weevil.
Hyperaspis campestris, notes, (43) 252.
Hyperglycemia, cause, (50) 164.
Hyperglycemia, observations on, (41) 364.
Hyperimmunity, destructive, in rabbits, (41) 186.
Hyperimmunization of cattle, (47) 82.
Hyperite, effect on forest soils, (47) 119.
Hyperteles lividus, notes, (49) Calif. 53.
Hyphantria cunea, *see* Webworm, fall.
Hypholoma perplexum, notes, (42) N.Y. State 350.
Hypobromite reaction on urea, (47) 315.
Hypocera incrassata, larva and pupa, (47) 554.
Hypochlorite—*see also* Chloramin-T and Dakin's solution.
solutions, assay of, (41) 715.
solutions, isotonic, for water sterilization, (41) 583.
Hypochlorites—
detection in milk and cream, (48) U.S.D.A. 12.
for seed disinfectant, (42) 146, 147.
Hypochnus—
solani, notes, (45) 354; (48) 349.
sp., notes, (43) 444.
theae, notes, (47) 754.
theobromae, notes, (49) 540.
Hypodaerium conoideum, life history, (49) 183.
Hypoderma—*see also* Ox warble fly and Warble flies.
bovis, life history, (41) 280.
crossii n.sp., description, (48) 485.
larvae, extracting from cattle, (47) 658.
larvae in goats, (46) 777.
lineatum, migration, (50) 880.
spp., control, (46) 684.
spp., in Switzerland, (50) 560.
spp., larval stages, (45) 555.
spp., life history, (42) 854.
spp., summary, (43) 55; (48) 751.
Hypodermella laricis, notes, (44) 347.
Hyponectria phaseoli n.sp., description, (45) 338.
Hypophysin, effect on milk secretion, (48) 265.
Hypophysis in the rat as affected by inanition and refeeding, (41) 270.
Hyposoter fugitivus pacificus n.form, description, (41) 261.
Hypotonic and hypertonic solutions, effect on respiration, (48) 124.
Hypoxanthin oxidation by tissues and milk, (48) 207.
Hypoxylon cocoinum, notes, (47) 547.
Hypsopygia costalis, notes, (44) Kans. 249.
Hysipyla robusta, monograph, (42) 854.
Ice cream—
acidity, discussion, (50) 378.
air cells in, (50) 782.
analyses, (43) Conn.State 859; (47) Me. 764; (50) Conn.State 160.
and the health officer, (49) 277.
as factor in dairying, (41) 774.
bacterial content, effect of manufacturing operations, (50) Mich. 580.
bacteriology, (41) Iowa 279; (47) 785; (50) 180, Mich. 496.
chocolate, greenish black color in, (50) 477.
colloid chemistry of, (41) 310.
composition and manufacture, (50) 281.
composition, changes in, (48) Mo. 671.
equipment, proper depreciation for, (47) 583.

Ice cream—Continued.

- fat content, effect on quantity eaten, (49) U.S.D.A. 580.
- fat standard, (45) 880.
- fillers for, (43) Wash. 780.
- formula, calculating, (48) 176.
- gelatin in, determination, (49) 13.
- gelatin, viscosity, and melting resistance, (49) 177.
- improvement by homogenization, (50) 782.
- industry, acidity problem in, (50) 281.
- ingredients, (50) Nebr. 580.
- ingredients, proportioning, (44) 576; (48) U.S.D.A. 378.
- inspection, (41) Me. 171; (47) Conn. State 559.
- inspection and analysis, (45) Conn. State 365.
- making, principles, (49) Nebr. 782.
- manufacture, (45) 381, Okla. 476; (47) Pa. 482; (49) Pa. 277; (50) Pa. 477.
- manufacture, cooperative, (45) 577.
- manufacture, effect of each ingredient, Mo. (45) 278; (46) 372; (48) 672.
- manufacture, manual, (42) 877.
- manufacture, superheated condensed milk in, (48) 673; (49) 679.
- mix, calculating, (46) 681; (47) Wis. 481; (48) 480.
- mix, effect of acidity, (50) 580, 679.
- mix, effect of composition on overrun, (48) 578.
- mix, formulas and standardizing, (50) 783.
- mix, notes, (47) Okla. 877.
- mix, preparing, (47) 785.
- mix, standardization, (47) 583; (48) 176.
- mix, viscolizing, (47) 382.
- packaging, (47) 583.
- palatability, effect of composition, (49) U.S.D.A. 579.
- plants, score card for, (44) 75.
- quality, factors affecting, (50) 782.
- quality, relation to composition of mix, (50) 477.
- sampling, (50) 878.
- sandiness in, cause, (45) 176; (46) 880; (47) 180; (49) Ind. 580; (50) Minn. 179.
- sandy crystals in, identification, (45) 780.
- sandy, prevention, (48) 673.
- score card, (47) Okla. 878.
- scoring, bacterial count in, (48) 877.
- smoothness, relation to air cells, (50) N.Y.State 581.
- standards in Wisconsin, (46) 681.
- studies at experiment stations, (46) 606.
- vitamins in, (49) 59.
- weight of gallon, (47) Calif. 676.

Ice—

- farm storage, (42) S.Dak. 81, U.S.D.A. 788.
- freezing cans, plans, (42) S.Dak. 81.
- house, farm, design, (46) Mich. 588.
- houses, plans, (42) S.Dak. 81, 489, U.S.D.A. 788.
- making and its machinery, treatise, (44) 487.
- storms, papers on, (43) U.S.D.A. 119.
- Iceland moss as famine food, (50) 561.
- Icerya purchasi, *see* Cottony cushion scale.
- Icerya spp., notes, (48) 459.
- Ichneumon flies—
 - new genera and species, (42) 362; (43) 857.
 - North American, (45) 459; (46) 464.
 - North American, new species, (42) 655; (44) 856.
 - North American, revision, (48) 59; (49) 855.
 - notes, (43) 858.
 - type species, (45) 860.
- Ichneumonidae—
 - economic importance, (46) 51.
 - in Pusa collection, list, (50) 58.
 - new genera and species, (45) 459; (47) 660.
 - of Finland, notes, (45) 258.
 - parasites of flies, (42) 361.
 - Thomas Say species, (46) 254.
- Ichneumonids, anatomy, (45) 655.
- Ichneumoninae, Holarctic tribes, (43) 858.
- Ichneumonoidea—
 - as parasites, (47) 659.
 - families and subfamilies, (41) 360; (42) 362.
 - new family in, (42) 456.
 - new genera and species, (41) 63, 261.
- Ichthyomethia, revision of genus, (43) 328.
- Ictero-hematuria, studies, (49) Colo. 476.
- Ictero-hemoglobinuria—
 - in cattle, (46) 684.
 - studies, Nev. (47) 185, 789.
- Idaho—
 - Seed Growers' Association, report, (44) 143.
 - Station, notes, (41) 199, 898; (43) 198, 497, 699; (44) 96, 395, 899; (45) 600, 900; (46) 195; (47) 498.
 - Station publications available, (43) 496; (46) 698.
 - Station, report, (41) 299; (43) 98; (45) 297; (47) 799; (49) 298, 798.
 - University, notes, (41) 199, 898, (42) 797; (43) 198, 699; (44) 96, 395; (45) 900; (47) 498; (50) 697.
- Idiocerus—
 - cognatus in New Jersey, (41) 549.
 - populi, notes, (46) 852.
 - scurra, notes, (44) 351.
 - spp., notes, (47) 254, 357; (48) 552.
- Idiosaissetia, new genus, erection, (45) 255.

Idolothripidae, new genera and species, descriptions, (42) 154.
 Ignition systems of motor vehicles, (44) 786.
 Iletin, lethal action, resistance of pigeons to, (50) 467.
 Ilem, H-ion concentration, (41) 765.
 Ilex as source of caffeine, (41) 409.
 Illinois pisi, control, (48) U.S.D.A. 457.
 Illinois—
 Agricultural Association, aim, (42) 790.
 Agricultural Policy, conference, (47) 196.
 Beekeepers' Association, report, (44) 760; (46) 463.
 College of Agriculture, history, (47) 798.
 State Grange, history, (47) 394.
 Station, notes, (41) 599; (42) 398, 695; (44) 395; (46) 499, 794; (47) 398; (48) 98; (49) 697.
 Station, report, (41) 198; (44) 898; (45) 94; (47) 898; (49) 395.
 Station, work of, (47) 798.
 University, notes, (41) 599; (42) 398, 695; (43) 198; (44) 298, 395, 599; (45) 300; (46) 298, 499, 699, 794; (47) 398; (48) 98; (49) 697; (50) 396, 899.
 University, semicentennial history, (45) 397.
 Illiterates, adult, education of, (48) 599.
 Imhoff tanks—
 fauna of, (50) 289.
 proper placing of slots in, (50) 389.
 Immigrant colonies, Americanization, (46) 191.
 Immigrants on the land, new and old, treatise, (48) 493.
 Immigration laws of Bolivia, synopsis, (43) 94.
 Immune bodies—
 normal, influence of desiccation on, (41) 874.
 transmission to young, (45) 382.
 Immune sera, coagglutinins in, (43) 581.
 Immunity—
 address on, (48) 675.
 antistreptococcal, studies, (41) 376.
 choice of methods, (42) 270.
 "destructive," in rabbits, (41) 186.
 development of conception, (48) 774.
 duration, (50) 681.
 establishment, (49) 782.
 in infectious animal diseases, (44) 475.
 in insects, (45) 852.
 in plants, (41) 656.
 in veterinary practice, treatise, (49) 78.
 local, studies, (50) 78.
 of fowls to cholera, (43) 278.
 of plants to their own products, (42) 227.
 passive, duration, (49) 478; (50) 783.

Immunity—Continued.

 production as affected by nutrition, (41) 574.
 production, biologics in, (49) Okla. 477.
 production, relation to absorption rate of antigen, (43) 381.
 reactions, analyses by colorimetric protein determinations, (43) 181.
 relation to complementary and opsonic functions, (43) 273.
 research, progress during the war, (43) 76.
 rôle of blood platelets in, (42) 176.
 rôle of lipoids in, (46) 276.
 science of, treatise, (47) 583.
 theories, (41) 186.
 transfer from horse to foal, (48) 675.
 vaccination, and serum therapy, treatise, (46) 880.
 Immunization—*see also* Anthrax, Tuberculosis, etc.
 against foot-and-mouth disease, (50) 683, 684.
 against sheep pox, (49) 480.
 by reinoculation after long interval, (50) 282.
 development of protein after prophylactic inoculation, (50) 680.
 effect of phase and amount of antigen, (42) 176.
 in rabbits against an organism of high virulence, (47) 879.
 mechanism of, (42) 270.
 of horses with swine erysipelas cultures, reactions, (49) 482.
 of monkeys against pneumococcus, (49) 880.
 of plants, (47) 645, 750; (49) 442.
 pneumococcus, antiblastic phenomena in, (42) 73.
 pneumococcus, studies, (42) 567.
 studies, (41) 576; (47) 484.
 therapeutic, new prospects in, (41) 187.
 with avirulent living organisms, (50) 282.
 Immunizing—
 properties, specific, of leucocytes, (42) 474.
 sera, anaphylactoid poisoning by, (41) 185.
 Immunotherapy, nonspecific, (46) 774.
 Imperata—
 arundinacea for paper making, (42) 531.
 spp. as paper-making material, (41) 532, 732.
 Imperial College of Tropical Agriculture, notes, (50) 499.
 Implement buildings, construction, (49) 586.
 Inanition—
 and avitaminosis, (45) 868.
 and polyneuritis, studies, (48) 865.
 calorimetric studies, (46) 359.
 clinical characteristics, (44) 863.

Inanition—Continued.

- effect on—
 - adrenals and thyroid, (45) 368, 667.
 - development and structure of testes, (46) 265.
 - pregnant rats and young, (46) 264.
 - resistance of red blood corpuscles, (43) 63.
 - rôle in polyneuritis in pigeons, (48) 865.

Inbreeding—

- and crossbreeding, (47) 75, 325.
- and crossbreeding in *Crepis*, (46) 223.
- and crossbreeding in guinea pigs, effect, U.S.D.A. (48) 263, 469.
- and crossbreeding, monograph, (42) 865.
- and relationship, coefficients, (46) 268; (48) 468.
- effect on growth curve in white mice, (41) 766.
- history of, (45) 773.
- in dairy cattle, (49) Ohio 375.
- numerical measure, (42) 63; (45) 771, 772.
- papers on, (49) 568.
- results, (45) 772.
- studies, (41) 267, 864.

Incinerator, beehive, construction and operation, (50) 89.

Income tax—

- applying to agricultural property, (50) 192.
- assessment of farmers in Great Britain, (50) 192.

"Inconstant," use of term, (43) 867.

Incosopol, use as insecticide, (42) 736.

Incubation, *see* Eggs, incubation.

Incubators—

- device for regulating temperature, (43) 822.
- different makes, Can. (50) 372, 472.
- management, N.J. (44) 871; (50) 873.
- use in Egypt, (42) 69.

Index cephalicus, (49) 770.

India rubber, *see* Rubber.

India wheat, digestibility coefficients, (48) 574.

Indian meal moth—

- control, (47) Calif. 654; (48) 554.
- notes, (42) Calif. 848.
- on date palm, (45) 552.
- on dried fruit, (41) 665.
- parasite of, (50) 663.

Indian spinach, use for greens, (42) 138.

"Indian summer," weather type of eastern United States, (50) 315.

Indiana Station—

- experimental orchard, report, (43) 237.
- notes, (41) 496; (42) 600; (43) 99, 198, 398, 799; (44) 298, 396; (45) 199, 600; (48) 695; (49) 899; (50) 697.

Indiana Station—Continued.

- report, (43) 397; (45) 197; (47) 196; (49) 599.

Indians, Pima, community work among, (49) 894.

Indican excretion as affected by diet, (44) 563.

Indican excretion by calves, (47) 76.

Indicator—

- beet extract, (41) 112.
- papers, preparation and use, (41) 11, 503.
- plants, (46) 28.

Indicators—

- change in sensitiveness, (46) 614.
- equation for pH determination of soils, (43) 211.
- industrial application, (42) 611.
- joint use of two, (46) 413.
- mixed, use, (48) 109.

Indigo—

- breeding experiments, (44) 633.
- culture experiments, (44) 137, 633, 827.
- culture in India, (41) 522, 529.
- fertilizer experiments, (47) 826.
- from *Lonchocarpus*, (41) 734.
- growth studies, (44) 633.
- industry, (41) 233.
- insects affecting, (43) 252.
- lysimeter experiments, (42) 277.
- natural crosses of, (44) 429.
- plants, nodule formation in, (48) 732.
- production, (46) 203.
- Psylla isitis* on, (43) 451.
- quality and yield as affected by cover crop, (44) 830.
- seed, deterioration in storage, (46) 133.
- seed production, (44) 633, 829.
- soils of India, (41) 516, 814, 816.
- variety tests, (44) 827.
- wilt in India, (48) 47.

Indol—

- determination in bacterial cultures, (42) 414.
- effect on nitrogen excretion of rabbit, (48) 766.
- formation during decomposition of salmon, (49) 802.
- production as affected by peptone, (46) 180.
- volatility, effect of H-ion concentration on, (42) 415.

Indols, test for, (45) 110.

Industrial—

- by-products as feeding stuffs, (43) 170.
- development of the South, (50) 399.
- prosperity in 1920, basic facts, (43) 92.
- raw material, present and potential production in French colonies, (49) 389.
- revolution in England, lectures on, (49) 295.
- wastes from stockyards, use, (46) 783.

Industrial—Continued.

wastes, treatment and disposal, (45) 591.

Industries of United States, (44) 393.

Infant—

bloods, alkalization, deleterious effect, (42) 256.

foods, analyses, (45) 414; (50) Conn. State, 160.

mortality, relation to breast and artificial feeding, (48) 655.

Infantile paralysis, *see* Poliomyelitis.

Infants—*see also* Children.

blood phosphate in, seasonal tide, (49) 58.

breast-fed and bottle-fed, acid stools of, (47) 463.

breast-fed, eczema in, (47) 370.

calcium metabolism, (42) 555, 661.

care of in rural Wisconsin, (41) 794.

cholesterol synthesis by, (43) 769.

creatinuria in, (42) 367.

diseases from excess carbohydrates, (45) 667.

fat metabolism, (42) 60.

fecal flora, bacteriological study, (46) 571.

fed dry milk powder, metabolism, (46) 756.

feeding, (41) 365, 561, 679, 859, 860.

feeding—

and diseases, (42) 660.

artificial, (42) 660; (43) 462.

bacteriologic study of breast milk and feces, (47) 463.

butter flour for, (42) 255; (43) 567.

butter soup feeding, (48) 655.

caseins of cow's and human milk, (46) 261.

directions, (43) 167.

dried milk in, (43) 566; (48) 757.

dry milk products in, (46) 863.

during first year, (48) 61.

during second year, (42) 555.

for preventing nutritional disturbances, (50) 59.

lactic acid milk for, (44) 64; (50) 856.

mineral elements in milk formulas, (46) 862.

modification of milk, (47) 166, 767.

natural and artificial, (44) 259.

potato flour for, (49) 457.

protein milk for, (44) 64.

rôle of antineuritic vitamin in, (42) 256.

tomato juice for, (41) 266.

vitamins in, (43) 166, 567, 663; (45) 863; (49) 856.

with milk from cows at end of lactation, (43) 272.

yeast as growth stimulant, (46) 759.

Infants—Continued.

intolerance for milk, treatment, (42) 660.

metabolism, (41) 761; (42) 168; (43) 166.

minimum fat requirements, (45) 163.

newborn, intestinal contents, (41) 68.

newborn, respiratory exchange in, (49) 15.

nursing, pellagra in, (43) 668.

rôle of cereals in nutrition of, (42) 462.

salivary secretion, (47) 766.

urine sugar in, (45) 263.

yeast therapy failure, (48) 656.

Infection—

and resistance, treatise, (50) 581.

by fungi, effect of temperature and humidity, (42) 242.

Infections—

genital, rôle of male in, (50) 783.

of unknown cause, specific antisera for, (42) 566.

sputum-borne, control, (43) 261.

Infective agents, theory of invasion by, (41) 777.

Influenza—

bacilli, growth studies, (46) 78, 79, 80.

bovine, studies, (49) 79, 785.

equine, *see* Pleuropneumonia.

of man and horse, comparison, (46) 278.

pneumonia, transmission by eating utensils, (43) 261.

Inheritance, *see* Heredity.

Inoculation—

artificial, studies, (48) 622.

chamber, iceless refrigerator for, (43) 444.

of plants, chambers for, (49) 821.

of soil, effect on alfalfa and clover, (48) Wis. 213.

Inonotus schini n.sp., proposed name, (47) 652.

Inorganic constituents of organic matter, (44) 712.

Inosite—

hexaphosphoric acid in maple seed, (46) N.Y.State 308.

hexaphosphoric acid, synthesis, (45) 611, 714.

hexaphosphoric ether of, synthesis, (44) 309.

phosphoric acid of plants, composition, (44) N.Y.State 410.

Inostemma leguminicolae, description, (49) 157.

Insect—

activity, effect of storms on, (44) 249.

anatomy, treatise, (50) 253.

artisans and their work, (42) 249.

behavior, treatise, (43) 50.

causation of disease, steps for investigation, (41) 456.

Insect—Continued.

- flagellates, infection of vertebrates by, (45) 387.
 - galls in Philippines, (42) 730.
 - life, (50) 496.
 - life on sewage filters, (42) 188.
 - life, treatise, (46) 456.
 - metamorphosis, researches on, (50) 356.
 - outbreaks and causes, (45) 454.
 - outbreaks in Idaho, (49) Idaho 756.
 - parasites of Indian crop pests, (45) 658.
 - pests and plant diseases, simultaneous treatment, (46) 851.
 - pests, control, (50) 356.
 - pests, organization of international measures for protection, (49) 548.
 - powder, adulteration, U.S.D.A. (41) 550; (43) 352.
 - powder, insecticidal principle of, (42) 647.
 - problems in Prairie Provinces of Canada, (42) 52.
 - survey of North Carolina, N.C. (43) 450; (49) 757.
- Insectary, underground, plans, (45) 655.
- Insecticidal plants, list, (41) 56.
- Insecticide—
- emulsion, improved, (45) V.I. 149.
 - from derris, tests, (41) 661.
 - law, résumé, (48) 152.
- Insecticides—*see also* *Sprays and specific forms.*
- adulteration, detection, (43) U.S.D.A. 353.
 - analyses, (43) N.J. 37, Me. 339; (44) N.J. 440; (45) N.Y.State 639; (46) Conn.State 522; (47) N.J. 140, Me. 441; (49) Conn.State 233, Me. 233, N.J. 233.
 - analysis, official method, (44) 9.
 - and fungicides, compatible combinations, (49) U.S.D.A. 448.
 - and natural control of insects, (50) 454.
 - arsenical, developments, (45) 455.
 - chemical investigations, (44) Oreg. 851.
 - comparative tests, (47) Minn. 362.
 - composition and use, (46) Mass. 38.
 - contact, studies, (49) U.S.D.A. 550.
 - description, (42) 341.
 - dust, value, (46) N.J. 556.
 - effect on larvae of oriental peach moth, (44) 551.
 - effect on plants, (43) N.H. 44.
 - effect on pollination, (47) 742.
 - examination, optical methods, (47) 15.
 - for citrus black fly, (44) U.S.D.A. 455.
 - for peach borer control, (48) N.J. 354.
 - for use against thrips, (47) 850.
 - formulas, (45) 44.
 - inspection and analyses, (41) N.J. 43, N.Y.State 237, Mich. 443; (42) 137; (46) Mich. 444.
 - law in Maine, (43) Me. 339.

Insecticides—Continued.

- legislation in United States, (44) 801.
 - lime-sulphur, (49) 145.
 - new, (46) 51, 748.
 - notes, (41) 354; (44) 56, 451, 535.
 - petroleum, experiments, (44) 651.
 - proprietary, tests, (42) Mass. 356.
 - recent developments in use, (49) 233.
 - soil, tests, (44) 852.
 - studies, (43) Oreg. 755; (47) 254.
 - summary, (50) 255.
 - tests, (41) Wis. 661; (44) Mo. 856, Conn.State 858; (50) 258.
 - toxicity, (44) Minn. 753.
 - treatise, (49) 51.
 - use against chicken lice and dog fleas, (44) U.S.D.A. 161.
 - use in California, (42) Calif. 848.
 - use in Quebec, (43) 844.
 - use in South Africa, (43) 834.
 - use of arsenicals as, (47) 655.
 - uses and manufacture, (46) 152.
- Insecto, value against potato pests, (42) Mass. 356.
- Insects—
- absence of complement in blood, (41) 754.
 - acquired immunity in, (45) 852.
 - affecting livestock, (50) 453.
 - affecting shade trees, (45) 254.
 - affecting sugar cane, (44) 847.
 - anatomy and physiology, treatise, (45) 453.
 - ancestry of, (45) 454.
 - and arthropods, (50) 554.
 - and injuries from, treatise, (46) 456.
 - and other invertebrates in arable land, (48) 457.
 - and pests, treatise, (48) 749.
 - and soils, relation, (48) 749.
 - and worms, parasitic relations, (50) 51.
 - as affected by cold storage, (42) Calif. 848.
 - as carriers of plant diseases, (43) 842; (47) 552.
 - as carriers of potato late blight, (48) 244.
 - as food, (46) 356.
 - as food for common whitefish, (49) 848.
 - attacking metals, (48) U.S.D.A. 555.
 - beneficial, (47) 655.
 - beneficial, distribution in Hawaii, (41) 549.
 - beneficial, predacious forms, (50) Ohio 554.
 - biology, formula of, (41) 661.
 - bloodsucking, as disseminators of anthrax, (49) La. 881.
 - bloodsucking, in the Philippines, (42) 54.
 - bloodsucking, rôle in transmission of disease, (47) 585, 588.
 - cage for rearing on plants, (50) 151.
 - causing apple scars, (47) N.Y.Cornell 757.

Insects—Continued.

- chemotropic responses of, (43) 553.
- climatic law, (41) 16.
- cold storage control, (46) 853.
- collecting and preserving, (41) 754; (42) 545; (45) 657, 852; (47) 253.
- control, (43) 842; (46) 336, 852.
- control—
 - application of bioclimatic law, (43) U.S.D.A. 509.
 - by biological method, (41) 754.
 - by dusting, (50) N.Y.State 555.
 - by heat, (47) Ohio 358.
 - by lizards, (44) 651.
 - dusting v. spraying for, (45) 137.
 - in China, (47) 254.
 - in India, (45) 656.
 - in national forests, (43) 148.
 - in New York State, (41) 245, 248; (49) 152.
 - in United States, (50) 255.
 - organization for, (41) 250.
 - relation to clean cultivation, (41) 456.
 - treatise, (50) 253.
- damage to timber, (49) 84.
- dissemination by wind, (43) U.S.D.A. 157.
- division in United States National Museum, (47) 253.
- dried, from Mexico, use in poultry feeds, (43) 53.
- economic—
 - in British East Africa, (44) 57.
 - in England, (42) 152.
 - in Hawaii, (42) 53.
 - in Kansas, (48) 52.
 - in Queensland, (46) 49.
 - methods of study, (42) 748.
 - of lower California, (44) 653.
 - of Sweden, treatise, (47) 253; (50) 153.
 - of United States and Canada, class book, (41) 56.
 - on sugar beets, (44) 351.
- effect of inanition, (50) 452.
- excluded from Hawaii, (46) 457.
- field book, (46) 49.
- Fijian, food plants or hosts, (48) 355.
- food habits and abundance, (48) 851.
- foreign, protecting American crops against, (41) 443.
- forest, *see* Forest insects.
- function in fruit pollination, (46) 840.
- fungus, and hosts, bibliography, (45) 253.
- fungus hosts of, lists, (43) 659.
- fungus parasites of, (41) 59; (43) 250.
- garden, *see* Garden insects.
- habits and metamorphoses, (46) 851.
- household, (50) Calif. 845.
- immigrants in Hawaiian Islands, (46) 656.
- in Brazil, systematic catalogue, (50) 51.

Insects—Continued.

- in British Guiana, annual loss caused by, (43) 850.
- in British Guiana, treatise, (41) 546.
- in Canada, papers on, (47) 756.
- in Connecticut, list, (45) 655; (50) 755.
- in dry belt of Canada, (48) 52.
- in flour mills, control, (44) U.S.D.A. 251.
- in freshly cut logs, (50) Minn. 152.
- in Great Britain, (46) 656.
- in India, (47) 254.
- in Indiana, (48) 52.
- in logs, ecology, (50) 755.
- in Ontario, (49) 848.
- in Pribilof Islands, (49) U.S.D.A. 652.
- in Quebec, (49) 848.
- in southern Nigeria, bionomics, (47) 357.
- in the upper air, (49) 747.
- in United States, summary, (48) U.S.D.A. 51.
- injurious, (48) Mass. 650.
- injurious—
 - and beneficial, treatise, (48) 749.
 - and parasites, (50) 554.
 - control, (45) 44, 254.
 - in Arizona, (49) 251.
 - in Assam, (42) 153.
 - in Australia, (43) 252; (45) 656.
 - in Austria, (44) 653.
 - in Barbados, (44) 57; (45) 755, 853.
 - in British East Africa, (44) 57.
 - in British Guiana, (41) 455; (44) 548; (48) 457.
 - in British Honduras, (47) 848.
 - in Burma, (50) 51, 153.
 - in California, (45) 853.
 - in Canada, (42) 545; (45) 655; (46) 748; (50) 454.
 - in Ceylon, (41) 455; (42) 152; (47) 357.
 - in Colorado, (50) 151.
 - in Connecticut, Conn. State (41) 159; (42) 648; (43) 252.
 - in Cuba, (41) 847; (43) 438.
 - in Dominica, (42) 152.
 - in Dutch East Indies, (44) 351; (46) 343.
 - in England, (41) 755; (44) 57.
 - in England and Wales, (43) 652; (48) 457; (50) 255.
 - in Fiji, (45) 656; (46) 245.
 - in Florida, Fla. (41) 455, 548.
 - in forests of Sweden, (48) 749.
 - in France, (41) 49, 50.
 - in Georgia, (50) 844.
 - in Germany, (47) 551.
 - in Guadeloupe, (44) 150.
 - in India, (41) 354, 455; (42) 545, 647; (45) 656, 657; (47) 357; (48) 152.
 - in Ireland, (45) 655.
 - in Jamaica, (42) 152; (46) 656.

Insects—Continued.

injurious—continued.

- in Kansas, (44) Kans. 249.
- in Mauritius, (42) 843; (47) 254; (48) 749.
- in Mesopotamia, (47) 357.
- in Michigan, (41) Mich. 660.
- in Minnesota, (41) 57.
- in Mississippi, (42) 249.
- in Missouri, (43) Mo. 758.
- in Montana, Mont. (41) 57; (43) 758.
- in Morocco, (46) 851.
- in Netherlands, (44) 642.
- in New Brunswick, (50) 844.
- in New Jersey, (41) N.J. 57.
- in New Jersey nurseries, (41) 549.
- in New York, (41) 159.
- in Nigeria, (46) 656.
- in North Carolina, (41) N.C. 660.
- in Norway, (44) 753.
- in Ontario, (41) 549; (45) 453, 454; (48) 852.
- in Philippines, (42) 53.
- in Philippines, host index, (48) 355.
- in Pulawy, (49) 252.
- in Queensland, (41) 549.
- in Rhine Province, (44) 150; (45) 551.
- in St. Thomas, (49) 540.
- in Scotland, (41) 549; (42) 851; (45) 853; (46) 656; (48) 354; (50) 153.
- in Seychelles, (41) 59.
- in South Africa, (41) 455, 549; (46) 153.
- in South Dakota, (41) 58; (43) 850; (46) 50.
- in Southern Rhodesia, (50) 153.
- in Sweden, (42) 152.
- in Tasmania, (42) 648.
- in Tennessee, (41) 754.
- in Texas, (43) 554.
- in Travancore, (46) 656.
- in Trinidad, (42) 356.
- in Uganda, (41) 455; (45) 656; (50) 555.
- in Union of South Africa, (46) 748.
- in Utah, (49) 848.
- in Virgin Islands, V.I. (48) 354; (49) 654.
- in Washington, (47) West.Wash. 551.
- in West Indies, (41) 59; (43) 252, 450, 554; (45) 550; (46) 557; (47) 551.
- in Zanzibar, (44) 753.
- survey work in United States, (49) 352.
- to crops, *see specific crops*.
- treatise, (43) 659.
- inoculating sugar cane with mosaic, mechanics of, (49) 47.
- instincts and habits, treatise, (49) 251; (50) 151.

Insects—Continued.

- keys to orders, (44) 451.
- larvae and pupae, preservation, (41) 56.
- laws regulating commerce in, (44) 836.
- life and seasonal cycles as affected by climate, (41) N.J. 58.
- life cycle in, (45) 250.
- life histories, (45) 359.
- light trap for, (49) 51, 550.
- live, in hermetically sealed tins, (42) 153.
- longevity, (50) 255.
- method of study, (46) 245.
- myrmecophilous, from Cuba, (42) 160.
- national collection of Canada, (50) 454.
- natural control, paper on, (44) 851.
- nema parasite of, (49) 357.
- nicotin sulphate dust for, (44) U.S.D.A. 651.
- nomenclature, (42) 647.
- nutritional study, (43) 51.
- of farm and garden, treatise, (45) 755.
- of fruit blossoms and pollination, (47) 757.
- of garden and orchard, control, (49) West.Wash. 395.
- of greenhouses, control, (50) 255.
- of stored grain—
 - and flour, (41) 456, 463, 549.
 - as affected by air-tight storage, (43) 253.
 - as affected by humidity, (41) N.J. 58.
 - vitality and rate of increase, (43) 254.
- of wheat flour and wheat flour substitutes, (41) 162.
- on imported nursery stock, (41) 251; (43) 352; (46) 748; (47) 552; (49) 352.
- on permanent pastures, (45) 358.
- on sewage filters, (43) 853.
- parasitic and disease-carrying, (50) Minn. 152.
- pH values in alimentary tract, (50) 452.
- predatory, value of experiments with, (43) 559.
- preserving for dissection, (43) 850.
- psychic life of, (48) 250.
- rate of development, effect of atmospheric moisture, (44) N.J. 350.
- rearing in hot climates, (47) 253.
- refrigerator for shipping, (50) 657.
- relation to—
 - disease dissemination in Tropics, (42) 174.
 - disease transmission, (42) 174; (44) 653, 754.
 - livestock and poultry, (44) 162.
 - man and agriculture, (45) 552.
 - man, textbook, (46) 152.
 - parasitic diseases in stock, (43) 883.

Insects—Continued.

relation to—continued.

poliomyelitis, (49) 450.

sugar cane mottling disease, (44) 847.

white pine blister rust, (43) 754.

resistance to *Bacillus hoplosternus*, (42) 153.

respiration, (46) 456; (49) 251.

rôle in pollination, (41) 330.

scale, *see* Scale insects.

selection of food plants by, (44) 348.

social life among, (48) 250.

social life among, treatise, (50) 253.

soil-infesting, studies, (41) N.J. 58.

starvation, effect on offspring, (50) 732.

studies, (46) 747.

subterranean, soil treatment for, (49) Wash.Col. 251.

sucking, control, (45) 254; (47) 52; (49) 152.

temperature studies, (49) 659.

toxic action of volatile substances on, (41) 456.

toxic effect of gases on, (44) U.S.D.A. 55.

transformation, treatise, (46) 456.

transmission on bud and grafting wood, (50) 453.

transmitting disease in Venezuela, (46) 852.

treatise, (48) 157.

use in medicine, (41) 661.

Insemination, artificial, (49) Ky. 164.

Insolation values, relative, (44) U.S.D.A. 717.

Institute of Nutrition in Holland, formation, (42) 499.

Insulating materials—

for cold storage work, (49) 186.

relative value, (44) 588.

tests, (46) 86, 692.

Insulin—*see also* Diabetes.

absorption from stomach, (50) 767.

action, mechanism, (50) 863.

action of proteolytic enzymes on, (50) 767.

and glycolysis, (50) 461.

cure, value of levulose and vitamin B in, (50) 864.

effect of ammonium hydroxid, (50) 802.

effect on glycogen in tissues, (50) 260.
in tissues other than pancreas, (50) 260.

physiology, (50) 260.

possible sources, (50) 767.

preparation, (50) 712.

purification, (50) 611.

purification and properties, (49) 803.

requirement, effect of carbohydrate and protein in diet, (50) 766.

solubility, (50) 311.

studies, (50) 864.

summary, (50) 611.

treatment, papers on, (50) 766.

Insurance—

accident, law for agricultural workers in France, (49) 693.

agricultural, in Argentina, (46) 592.

agricultural, in France, (41) 793.

agricultural, in Philippines, (41) 793.

compulsory accident, in Italy, (50) 292.

cooperative farm, (50) 593.

crop, (46) U.S.D.A. 787.

crop, method, (46) 788.

farmers' mutual, (41) U.S.D.A. 194.

fire, *see* Fire.

hail, *see* Hail.

mutual, in Italy, (44) 191.

unemployment, in agriculture, (46) 495.

weather, (47) 209.

Interceptometers, rainfall, description, (42) U.S.D.A. 318.

International—

Association of Dairy and Milk Inspectors, report, (46) 174; (47) 280; (49) 276, 698; (50) 875.

catalogue of—

bacteriology, (43) 227; (46) 222.

botany, (43) 227.

chemistry, (41) 501.

meteorology, (42) 118.

physiology, (44) 556.

serum physiology, (43) 227; (46) 222.

Conference of Phytopathology and Economic Entomology, (49) 398.

Congress for Cattle Breeding, (48) 500.

Congress of—

Eugenics, (49) 567.

Household Economy Instruction, (49) 897.

Landworkers' Unions, (45) 594.

Cotton Congress, report, (49) 331.

Cotton Federation, courts of arbitration, (49) 331.

critical tables of numerical data, (50) 885.

Farm Congress, yearbook, (45) 191.

Federation and Office for Development of Home Economics Education, (49) 897.

Institute of Agriculture—

at Rome, (45) 893; (49) 492.

memorial to David Lubin, (44) 398, 900.

proceedings, (48) 494.

relation to agricultural education and research, (49) 596.

labor organization and agriculture, (49) 693.

meteorological committee, (42) U.S.D.A. 620.

Potato Conference, report, (47) 36.

Research Council, (41) 399.

Seed Testing Conference, report, (50) 237.

White Pine Blister Rust Conference, (43) 755.

- Interrelations in nature, paper on, (47) 757.
- Intersexuality, studies, (50) 130, 226, 430, 530.
- Interstitial cells—
in fowls, (42) 668.
origin and evolution, (44) 468.
- Intestinal—
bacteria, factors affecting, (48) 164; (49) 561.
coccidium of the rabbit, new, (41) 784.
contents, reaction, (44) 666; (47) 264.
diseases, honey as carrier, (43) Colo. 163.
flora—
as affected by diet, (46) 666.
in children, regulation through diet, (42) 165.
in mouse typhoid, (49) 79.
of polyneuritic pigeons, (48) 363.
of rats on vitamin A deficient diet, (48) 260.
transformation of, (43) 769.
invagination in sheep, (41) 873.
obstruction, bacterial flora in, (44) 66.
parasites of horses, treatment, (46) 685.
parasites, remedies, (41) 286, 480, 782.
roundworms in poultry, (49) West. Wash. 395.
roundworms in swine, (47) Nebr. 789.
worms in pigs, (43) 384; (46) 685.
- Intestines—
human, Coleoptera in, (47) 358.
H-ion concentration of ileum, (41) 765.
pathological changes in deficiency diseases, (42) 464.
zinc content, (45) 64.
- Intoxication, alimentary, in children, (42) 166.
- Intussusception in sheep, (41) 873.
- Inulin—
analyses, (50) Conn.State 160.
behavior in the animal body, (41) 12, 764.
constitution, (50) 505.
content of globe artichoke, (44) 110.
detection and identification, (47) 205.
identification, (49) 112.
in plants, origin and transformations, (42) 226.
preparation from artichokes, (47) 202.
- Invertase—
activity—
in plants, (44) Del. 424.
in saturated sugar solutions, (42) 803.
of mold spores in sugar, (43) 433.
of yeast, effect of stimulating substances, (46) 759.
for sucrose determination, (46) 306.
in pollen, (48) 728.
in sirup manufacture, (46) 312.
- Invertase—Continued.
inhibition in snowdrop, (45) 820.
secretion by plant roots, (45) 628.
- Invertebrates—
hematophagous, parasites of, (48) 649.
marine, composition, (47) 660.
- Invertin in honey, (43) 314.
- Iodamoeba—
wenyoni, frequency in swine, (47) 884.
williamsi, notes, (49) 477.
- Iodic acid, use as microchemical reagent, (45) 206.
- Iodid, determination in mineral waters and brines, (41) 12.
- Iodids—
alkaline, determination, (42) 111.
ammonium mercuric, preparation and properties, (42) 312.
- Iodin—
and hairlessness in pigs, (47) 278.
behavior and reactions in chronic infections, (41) 781.
behavior of phenolphthalein with, (44) 11.
compounds of thyroid, isolation, (41) 409.
determination, (44) 113, 114.
determination in marine algae, (42) 111.
determination in mineral waters, (43) 13.
determination in organic substances, (42) 711.
determination in plants, (43) 204.
determination in thyroid preparations, (42) 614.
distribution in thyroids, (45) 266.
for prevention of goiter, (44) Wash. 479; (49) Wis. 681, 769.
for prevention of soft-shelled eggs, (42) Wis. 376.
germicidal value, (44) 680.
in food materials, (45) 665.
in plants, (43) 632.
in subterranean waters, (47) 288.
metabolism, (50) 865.
method for determining soil acidity, error in, (46) 503.
number of essential oils, (43) 315.
occurrence in nature, (50) 608.
requirements of livestock, (49) Wis. 167.
rôle in nutrition of maize, (41) 820.
sources in food supply, (48) 861.
trichlorid, effect on tetanus, (44) 780.
use in determination of sugars, (48) 414.
- Iodin-neol preparations as disinfectants, (43) 683.
- Iodized chloroform in war surgery, (41) 83.
- Iodometric studies, (41) 504; (43) 204; (46) 615.
- Iodotannic test, red, studies, (41) 207.
- Ions, effect on rate of diffusion, (46) 127.
- Iowa—
Beekeepers' Association, proceedings, (48) 359.

Iowa---Continued.

College, notes, (41) 300, 398, 496, 700; (43) 99, 198, 398, 899; (44) 797; (45) 95; (46) 195, 794; (47) 398, 698; (48) 696, 796; (49) 98, 196, 697; (50) 396, 497, 899.

Engineering Society, proceedings, (50) 586.

Station, notes, (41) 398, 700; (43) 99, 198; (44) 797; (45) 95; (46) 794; (47) 800; (48) 696; (49) 98, 196, 496, 697; (50) 497.

Station, report, (41) 299; (44) 495; (46) 394; (47) 799; (49) 798.

Ipecac, value in blackhead treatment, (48) 183.

Ipidae—

new species from Maine, (50) 453.

North American, new genera and species, descriptions, (46) Miss. 461.

Ips—

cembrae as permanent pest, (50) 255.

longidens, notes, (41) 758.

pini on jack pine, (47) 856.

spp. in Sweden, notes, (41) 455.

spp., notes, (44) 250; (48) Calif. 550.

typographus, control, (50) 255.

Iridaea laminarioides, mucilaginous substance of, (44) 202.

Iridomyrmex—

humilis, *see* Ants, Argentine.

humilis arrogans, notes, (46) 851.

melleus, notes, (49) 550.

Iris—

bearded, history of, (44) 147.

bearded, Mendelian characters in, (44) 45.

berer, control, (45) 759.

cell structure, studies, (50) 427.

culture in United States, (45) 744.

disease, studies, (48) 746.

hybridization in, (45) 744.

leaf miner in New Jersey, (41) 549.

leaf scorch, notes, (47) 541.

leaf spot, studies, (45) 547.

poisoning of calves, (41) 782.

root borer, notes, (41) Conn.State 159; (44) 352.

sawfly, oviposition and habits, (46) 857.

soft rot, studies, (50) 354.

varieties, (48) Can. 38.

Irises, classification, (46) 842.

Irish—

Agricultural Organization Society, report, (45) 897; (48) 391.

moss, adulterant for marmalades, (42) 415.

rhizome rot, notes, (48) 242.

Iron—*see also* Ferric and Ferrous.

accumulation in diseased cornstalks, (44) 541.

arsenate, effect on foliage, (49) 750.

as toxic to plants, (45) 29.

assimilation, rôle of vitamins in, (49) 564.

Iron—Continued.

availability as affected by ammonium sulphate, (46) N.J. 526.

availability to plants, factors affecting, (48) N.J. 326; (50) 212.

cause of formalin diphenylamin reaction of milk, (45) 718.

chlorid, effect on soil permeability, (47) 20.

colloidal, effect on basal metabolism, (46) 356.

compounds, effect on corn, (44) 326.

deficiency in diet of pigs, effect, (50) 172.

detection in animal tissues, (49) 408.

determination, (41) 711.

determination of small quantities, (43) 311.

effect on corn, (49) 519.

effect on growth of *Aspergillus*, (49) 27.

effect on oxidation of sulphur, (45) 332.

effect on spring wheat, (46) 629.

effect on superphosphates, (44) 23.

effect on wheat, (42) 218.

importance in nutrition, (46) 259.

in blood and spleen of horses with infectious anemia, (50) 684.

in blood, determination, (49) 113.

in green vegetables, (48) 159.

in lettuce, (49) 503.

in plants, studies, (50) 128.

in seeds, (49) 202.

in soil extracts, effect of fertilizer salts, (43) Mich. 125.

industry, by-products, value, (44) 725.

inorganic, effect on blood regeneration, (44) 565.

metabolism and vitamins, (49) 564.

metabolism as affected by high altitudes, (43) 565.

oxidation, effect of chemical agents, (49) 617.

phosphate as source of phosphorus, (47) 623.

phosphate v. tricalcium phosphate, (48) 622.

pyrites, oxidation by microorganisms, (48) 427.

relation to plant chlorosis, (44) 243.

rustproofing, metallic coatings for, (48) 784.

salts, antagonistic action, (44) 20.

salts as soil amendments, (41) 326.

salts, behavior of plant cells toward, (48) 827.

salts, effect on bacteriological analysis of water, (49) 285.

salts, effect on corn, (47) Ind. 147; (49) 327.

sulphate—

fertilizing value, (46) 522.

for dandelion eradication, (43) N.Y.State 535.

for weed eradication, (49) 738.

fungicidal value, (43) Mass. 155.

Iron—Continued.

- sulphate—continued.
 - solution, use against chlorosis of conifers, (45) 250.
 - sprays, fertilizing value, Hawaii, (41) 138, 148.
- sulphates, effect on alkali salts, (42) Calif. 813.
- sulphid, oxidation products in peat soils, (44) 625.
- sulphid, use as indicator, (43) 11.
- use in nutrient solutions, (41) 430.
- Ironbark and jarrah, strength, (47) 189.
- Ironbarks of New South Wales, (41) 744.
- Ironing, energy expenditure during, (44) 66.
- Irrigable land in United States, (41) U.S. D.A. 693.
- Irrigated field crops for hog pasturing, (41) U.S.D.A. 72.
- Irrigated lands, drainage, (41) 786; (42) 780.
- Irrigation—
 - activities and expenditures in India, (49) 586.
 - along the Nile, effect, (46) 495.
 - and drainage plant, combined, (48) 384.
 - and religion, treatise, (48) 494.
 - and water conservation in New South Wales, (47) 685.
 - application of water in, (45) 387.
 - border method, (47) U.S.D.A. 287.
 - by well water in Argentina, (43) 279.
 - canal drops, construction, (43) 888.
 - canals, algae in, (41) 883.
 - canals, cleaning, (47) 88.
 - canals, concrete lining for, (41) Ariz. 379; (43) 588; (47) 87; (49) 685.
 - canals, design and construction, (41) 883.
 - canals, earth, seepage from, (48) 884.
 - canals, leakage, (41) 883.
 - canals, seepage losses, (41) 482, 687; (46) 84.
 - canals, siphon spillways for, (43) U.S.D.A. 787.
 - canals, stopping of sink holes in, (43) 888.
 - canals, water flow in, (43) U.S.D.A. 788.
 - canals, water measurement devices, description, (49) 886.
 - census, outline of inquiries, (42) 576.
 - climatic conditions controlling, (41) U.S.D.A. 417.
 - conservation of Colorado River water for, (48) 89.
 - corrugation method, (50) U.S.D.A. 84.
 - costs under pumping system, (45) Nebr. 586; (50) 483.
 - development in Alberta, (45) 809.
 - development of institutions under, (46) 595.
 - development of West under, (50) 385.
 - devices, homemade, (50) 385.

Irrigation—Continued.

- district laws of California, (47) 685.
- districts, formation, (48) 383.
- districts, operation, (50) U.S.D.A. 186.
- districts, operation in Colorado, (49) 383.
- ditches, measurements of flow, (41) 583.
- ditches, pasturing with sheep, (48) U.S.D.A. 270.
- during blossoming time, effect on olives, (48) Ariz. 442.
- effect of time on barley kernel development, (45) 128.
- effect on—
 - alfalfa roots, (42) Calif. 823.
 - alkali salts and plant-food constituents, (49) N.Mex. 886.
 - Egyptian agriculture, (48) 813.
 - humidity, (42) 214.
 - seed potatoes, (47) 36.
 - transpiration of fruit trees, (48) 236.
 - tree growth, (47) Calif. 639.
 - vertical movement of alkali, (48) 422.
- engineering, treatise, (42) 479.
- experiments, (44) U.S.D.A. 189; (46) Mich. 537; (48) Calif. 585; (49) Oreg. 510; (50) Mo. 15.
- experiments—*see also special crops.*
 - in Germany, (42) 276; (44) 380.
 - short-time, unreliability of, (43) 822.
- farming, types, (45) Utah 189.
- field, experimental, studies at, (48) 883.
- flumes, cement plaster lining for, (44) 584.
- flumes, paper lining for, (42) 576.
- flumes, replacing wood with metal, (42) 780.
- important advances, (50) 99.
- in Ajmer-Merwara District, (50) 286.
- in Argentina, (43) 279, 477.
- in Arizona, (42) 274.
- in British Columbia, (47) 685.
- in California, (42) 478, 572, Calif. 812; (45) 790.
- in California, list of references, (50) Calif. 285.
- in California, new development, (42) 681.
- in Canada, (42) 479; (46) 487; (48) 586.
- in Colorado, (42) 478.
- in Egypt, (41) 483; (42) 276.
- in Idaho, (47) 87.
- in India, (42) 384, 479; (43) 477; (45) 184, 687; (46) 84, 487, 779; (48) 89, 286, 383, 781; (50) 484, 686.
- in India, triennial review, (48) 682.
- in Italy, (43) 587.
- in Java, (44) 883.
- in Kansas, (45) 586.

Irrigation—Continued.

- in Madras, (42) 276.
- in Montana, (45) 586.
- in Nevada, (41) Nev. 728; (42) 682.
- in New Mexico, (42) 572.
- in New South Wales, (42) 780; (43) 477; (45) 387; (49) 284.
- in New Zealand, (46) 886.
- in northern Colorado, (47) U.S.D.A. 487.
- in Oklahoma, (43) 185.
- in Sind, (42) 183.
- in South Africa, (46) 487; (48) 183.
- in southern States, (43) 476.
- in tropical climates, treatise, (46) 282, 584.
- in United States, (42) 384.
- in Utah, plant-food supply from waters, (41) 583.
- institutions, development, treatise, (45) 387.
- laterals, cypress lath for, (41) 482.
- laws in Oregon, (42) 479.
- laws in Texas, (45) 890.
- of citrus groves, studies, (47) Calif. 538.
- of Egyptian soils by flooding, (50) 512.
- of lowland moor soils, (41) 786.
- of orchards, (41) 515.
- of peat soil, (43) Oreg. 22.
- of rice seed beds, (49) 633.
- of sandy soils, (45) Oreg. 485.
- of wild meadow and tule land, (43) Oreg. 21.
- on the Niger, (49) 82.
- on Yuma project, U.S.D.A. (43) 392; (48) 293.
- opportunities in Russia, (41) 481.
- pipe, cement, Ariz. (41) 288; (43) 788.
- plant, spray, for truck farms, (44) 883.
- popular account, (45) U.S.D.A. 789.
- porous-cone, for potted plants, (41) 631.
- practices, discussion, (43) 279.
- project in Porto Rico, (48) 781.
- project of Columbia River Basin, (44) 380; (48) 383.
- project on Piave River, Italy, (49) 588.
- project, Rio Grande, (50) 84.
- pump, (43) Ariz. 788.
- pump, fuel oil for, supply and price, (45) Ariz. 80.
- pumping, advantages of engine power, (42) 184.
- pumping for, (41) 481, 785; (49) 886.
- pumping plant, small, (41) Oreg. 688.
- pumping plants, description, (44) 284.
- rating boxes, (47) 87.
- relation to brak or alkali, (43) 624.
- reports, (46) 84.
- requirements of California lands, (50) 84.
- reservoirs, leakage, (41) 883.
- reservoirs, siphon spillways for, (43) U.S.D.A. 787.

Irrigation—Continued.

- resources of Colorado River, (47) 187.
- rice, rôle of tides in, (43) 689.
- seepage and waste water losses, (43) 788.
- soil moisture equivalent under, (42) 620.
- status and problems, (48) 196.
- status in Washington and Oregon, (42) 288.
- structures—
 - design, (47) 187.
 - farm, construction, (50) 385.
 - precast concrete slabs for, (43) 587.
 - standardized appliances, (48) 587.
 - tar paint for, (44) 687.
- studies, (41) Ariz. 379; (44) Oreg. 719; (45) Ariz. 485; (48) Ariz. 486; (49) Wash.Col. 209, Wash.Col. 284.
- surveys in Canada, (43) 279.
- system of the Konia plain, (42) 480.
- systems, (47) Oreg. 886.
- systems, water requirements, (43) 588.
- treatise, (41) 481; (43) 387; (45) 788.
- use of ground water and drilling for, (44) 684.
- water, alkali—
 - control, (42) Calif. 813.
 - danger to soil, (42) 119.
 - effect on citrus trees, (42) Calif. 640.
 - effect on plants, (42) Utah 276.
 - use, (47) 886.
- water—
 - analyses, (45) Ariz. 485; (46) 117.
 - and rice soils, studies, (49) Calif. 34.
 - discharge through adjustable submerged orifices, (48) 883.
 - dissemination of weed seeds by, (44) Colo. 233.
 - distribution after, (47) Calif. 617.
 - duty of, (41) Nev. 728; (42) 275, 480, Oreg. 575; (43) Oreg. 22, 279; (45) 184; (47) Oreg. 132, Utah 885; (48) Utah 284; (49) Oreg. 526.
- water, duty of—
 - in Nevada, (42) 682.
 - in relation to yield, (43) Utah 230.
 - increasing, (48) 681.
 - on rice, (44) Calif. 282.
 - studies, (49) Mont. 184.
 - with pumping system, (43) 477.
- water—
 - economical use, (50) 384.
 - effect on heavy soils, (42) Calif. 812.
 - effect on pH value and freezing point depressions, (42) 119.
 - effect on soil composition, (48) 118.
 - field examination for, (46) 282.

- Irrigation—Continued.
 water—continued.
 from King's River, use, (43) 588.
 in India, analyses, (43) 185.
 losses in India, (42) 384.
 measurement, (41) 481.
 measurement on the farm, (48) Calif. 681.
 methods of measuring, (42) 480.
 movement in soil, (43) N.Mex. 386.
 of Utah, composition, (41) 288, 583.
 quality, relation to land reclama-
 tion, (45) 387.
 quantity, relation to crop yields,
 (47) Kans. 629.
 requirements, (44) Oreg. 334.
 return-flow from, (47) 686.
 saline, effect on walnuts, (47)
 Calif. 626.
 saving, in wheat growing, (46)
 487.
 soil capacity for, (48) 88, 780.
 storage in Arizona, (42) 274.
 supplies, (43) Ariz. 788.
 use, (43) 587.
 use and waste, (42) Ariz. 276.
 weir, construction, (49) 789.
 winter, studies, (42) Kans. 79.
 with Nile water, effect, (50) 316.
 with sewage, (44) 420.
- Irvingia gabonensis, description, (45) 743.
- Isachne, revision, (44) 327.
- Isaria—
 densa, egg albumin complete food for,
 (42) 821.
 densa, production of glycocoll by, (42),
 821.
 sp., studies, (44) 27.
- Isariopsis griseola, notes, (45) 846.
- Ischiogonus syagrii—
 in Hawaii, (48) 158.
 n.sp., description, (48) 857.
- Ischnorrhynchus resedae, studies, (46) N.Y.
 Cornell 465.
- Isellema spp., analyses, (45) 376.
- Isle of Wight disease, *see* Acarine disease.
- Isoanaphylaxis in cattle producing serum
 against rinderpest, (49) 884.
- Isoelectric points, calculation, formulas,
 (49) 501.
- Isodon puncticollis in soil, remedy, (45)
 258.
- Isoprene production from turpentine, (44)
 806.
- Isopropyl alcohol substitutes for grain
 alcohol, (47) 13.
- Isosoma—
 revision, (41) 667.
 tritici, summary, (45) Mich. 251.
 vaginicola, notes, (45) Mich. 252.
- Isotonic coefficients, use in determination
 of permeability, (42) 227.
- Italian Federation of Agricultural Societies,
 (45) 594.
- Itonididimariae, studies, (41) 160; (47)
 550.
- Itoplectis annulipes, notes, (44) U.S.D.A.
 163.
- Ivory nut—
 chips and meal, digestion coefficients,
 (43) 266.
 mannose preparation from, (46) 612.
- Ivy, bacterial disease, notes, (45) 54.
- Ixodes—
 holocyclus, notes, (45) 883.
 ricinus, notes, (42) 382; (46) 484.
- Ixophorus unisetus, history of, (44) 26.
- Ixora butterwickii n.sp., description, (42)
 142.
- Jack beans—
 analyses, culture and uses, (43) U.S.
 D.A. 233.
 as cover crop, (46) Guam 726.
 culture experiments, (45) Guam 34.
 mineral constituents, translocation,
 (41) 726.
- Jackdaw, food habits, (41) 454.
- Jacks—
 enrollment, (44) Ind. 774.
 in Indiana, Ind. (41) 178; (43) 269.
 in Oklahoma, (42) Okla. 561.
- Jagziekte in horses, (44) 76.
- Jams—
 analyses, (43) Conn.State 859.
 artificial color detection, (44) 115.
 effect of sugar on microorganisms in,
 (42) 114.
 insoluble solids in, determination, (42)
 415.
 pectin in, use, (47) 262.
 recipes, (47) 113.
- Janus integer, notes, (45) Conn.State 149.
- Japanese beetle—
 control, (44) 852; (46) 661; (47) 56,
 854; (48) 57, Hawaii 355; (50)
 N.J. 56.
 feeding habits affecting control, (49)
 U.S.D.A. 454.
 flies parasitic upon, (49) 453.
 green, notes, (48) N.J. 353.
 in New Jersey, (41) 666.
 larva and related form, (45) 361.
 larvae in balled earth about roots of
 conifers, (46) 251, 252.
 larvae in golf greens, control, (49)
 657.
 larval food habits, (47) 854.
 life history and control, (43) 558.
 notes, (43) 362; (48) U.S.D.A. 52,
 N.J. 353.
 quarantine, (46) 751.
 response to light, (45) 558.
 spread, (49) 854.
 summary, (49) 454.
- Japanese cane—
 fertilizer experiments, (41) Fla. 527.
 notes, (49) Guam 427.
 seeding experiments, (43) Tex. 230.
 spraying with copperas, (41) Hawaii
 138.

- Japanese farmers in California, (44) 191.
 Japanese Society of Veterinary Science, journal, (46) 900.
 Jarrah and ironbark, strength, (47) 189.
 Jasmine perfume production, (44) 45.
 Jassids, parasite of, (44) 167.
 Jassoidea of Honduras, new species, (41) 356.
 Jatropha stimulosa seeds, analyses, (50) 610.
 Jaundice—
 epidemic, in wild rats, (44) 849.
 infectious, *see* Spirochaeta icterohaemorrhagiae.
 malignant, *see* Piroplasmosis, canine.
 of bovines in Africa, (43) 883.
 Java almond oil, digestibility, (47) U.S.D.A. 560.
 Javel water as seed disinfectant, (42) 146.
 Jellies—
 analyses, (43) Conn.State 859.
 antiscorbutic, (41) 470.
 artificial color detection, (44) 115.
 citrus fruit, recipes, (48) U.S.D.A. 13.
 formation, rôle of acids in, (49) Del. 9.
 pectin in, use, (47) 262.
 preparation of fruit juices for, (47) Calif. 613.
 recipes, (47) 113.
 Jelly—
 clarification with enzymes, (47) 206.
 making, (50) 160.
 making from grape skins, (45) U.S.D.A. 209.
 making from pineapple juice, (44) Hawaii 16.
 making principles, application to Hawaiian fruits, (49) Hawaii 411.
 making, relation of pectin and acidity, (47) 857.
 making, teaching in rural schools, (44) 795.
 powders, analyses, (42) 162.
 proportions of acid, pectin, and sugar for, (43) 616.
 strength tester, plunger type, (50) 12.
 Jenkins, E. H., biographical sketch, (49) 3.
 Jewish Agricultural and Industrial Aid Society, report, (41) 94; (43) 192; (45) 88; (46) 693; (48) 891; (50) 894.
 Jiggerwood, durability tests, (43) 44.
 Jimson weed—
 cross pollination, (42) Wis. 338.
 mutants, characters, (44) 327.
 variations in, (49) 567.
 John's disease—
 and detection, (46) 682.
 detection, new method, (45) Wis. 284.
 diagnosis, (44) 682.
 studies, (41) 84; (42) 881; (47) Wis. 482, Wis. 789.
 Johnin, tests, (47) Wis. 482.
 Johnson grass—
 as a weed, (41) Iowa 40.
 culture experiments, (45) Kans. 33.
 eradication, N.Mex. (41) 139; (49) 525.
 Johnson grass—Continued.
 prussic acid, poisonous to cattle, (46) 484.
 seed, analyses, (44) 233.
 seed, dormancy, afterripening, and germination, (49) 28.
 seed, germination, (44) 232, 233.
 seed, viability tests, (44) 232.
 Joint-ill—
 control, (48) 882.
 in colts, (42) Mich. 694.
 in foals, (41) 480, 879; (44) 180; (45) 483, 585; (46) 278.
 in foals, prophylaxis of, (43) 585.
 of lambs, etiology, (46) 776.
 origin and prevention, (47) 588.
 serum treatment, (43) 278; (48) 879.
 treatment, (42) 382, 571, 679, 680.
 treatment with blood of dam, (48) 882.
 Jointworm—*see also* Wheat jointworm.
 flies, life history and habits, (42) U.S.D.A. 752.
 notes, (44) N.J. 349; (46) Ohio 351.
 parasites, life history, (45) 460.
 Jola—
 culture experiments, (44) 137.
 fertilizer experiments, (48) 435.
 root parasites, (46) 343.
 smut, (42) 46.
 Jolly bodies in anemic blood, (41) 875.
 Jordan, W. H., biographical sketch, (45) 97, 305.
 Journal of Agricultural Research, (49) 710.
 Jowar—
 breeding experiments, (48) 629.
 culture experiments, (44) 527, 632; (46) 437; (48) 629.
 rotation experiments, (44) 632; (46) 437; (48) 629.
 smut, control, (43) 445.
 stem borers, (47) 357.
 varieties, classification, (44) 528.
 variety tests, (44) 632; (46) 437; (48) 629.
 Juglans—
 abscission in, (41) 134.
 californica quercina, abscission in fruits, (46) 529.
 regia, oil from, analysis, (42) 410.
 regia, winter injury, (42) Calif. 354.
 species in Indo-China, (45) 345.
 Jujubes—
 culture, (44) Ariz. 532.
 culture at San Antonio, (47) U.S.D.A. 438.
 culture experiments, U.S.D.A. (48) 235; (50) 138.
 culture in India, (42) 442.
 culture in Sind, (41) 837.
 storage, notes, (48) Calif. 535.
 tryptid affecting, (49) 849.
 Jules caeruleocinctus, notes, (47) N.Y.Cornell 848.
 Jume, industrial exploitation in Tucuman, (42) 233.

- Juncus* spp., analyses, (41) Wyo. 333.
- June beetle—*see also* *Lachnosterna*, May beetle, and *Phyllophaga*.
green, (45) N.C. 362; (47) U.S.D.A. 854.
- June beetles, life history, (45) 454.
- Juniper—
blight, description, (45) 548.
seeds, afterripening and germination, (48) 525.
webworm, notes, (46) 750.
- Junipers, natural reproduction on open areas, (46) 542.
- Junket powders, analyses, (42) 162.
- Jute—
analyses, (43) 829.
baled, "heart damage," (41) 451.
black band, notes, (43) 444, 652; (44) 445; (45) 48, 647, 843.
chlorosis, (45) 649.
culture and manufacture, treatise, (46) 134.
culture experiments, (42) 132; (45) 34, 532; (46) 131.
culture in India, (41) 522, 529.
determination of flexibility, (46) 230.
diseases in relation to manures, (50) 42.
diseases, studies, (48) 47.
experiments in Bengal, (46) 32.
fertilizer experiments, (42) 132; (45) 34; (46) 131; (47) 32.
improvement in Bengal, (50) 828.
in Bengal, treatise, (46) 533.
in textile industry, (49) 528.
Industry, (45) 899.
industry in India, (46) 834; (48) 530.
industry in Ireland, (46) 834.
natural crosses of, (44) 429.
variety tests, (42) 132; (45) 34; (46) 131.
- K. H. reaction—
for dourine diagnosis, (44) 781.
test for glanders, (44) 779.
- "Kadondong" beetle—
life history, (47) 658.
notes, (49) 255.
- Kafir—
analyses, (45) Okla. 433.
ant, notes, (48) 651.
ants attacking, (43) Kans. 763.
as dry-farm crop, (41) Ariz. 29.
as silage crop, (41) Kans. 34.
beer, antiscorbutic value, (47) 568.
chop, analyses, Tex. (42) 769; (45) 68; (46) 675.
culture experiments, (42) Guam 31; (43) Okla. 32; (47) N.Mex. 333, Okla. 824; (49) Okla. 414.
culture in South Africa, (41) 528.
digestibility coefficients, (48) 574.
effect on following wheat crop, (49) 332.
effect on soil, (41) Kans. 34.
feeding value, (41) Kans. 71, 367; (42) Kans. 264; (47) Okla. 71; (49) Okla. 467.
- Kafir—Continued.
fertilizer experiments, Kans. (41) 33; (44) 225.
for wintering ewes, (42) Okla. 265.
growing with soy beans, (41) Mo. 637.
growth and yields, (45) Tex. 233.
inbreeding and headtype studies, (49) Tex. 429.
irrigation water requirements, (47) Kans. 630.
meal, analyses, (46) Tex. 675.
milling and baking tests, (41) Kans. 64.
nitrogen distribution of proteins, (45) 717.
pink, analyses, (45) 41.
roughages for beef heifers, (44) Kans. 470.
seeding experiments, (46) U.S.D.A. 637.
silage and fodder, feeding value, (41) 367.
spacing tests, (45) Okla. 430.
type and variability in, (45) Tex. 535.
variety tests, (42) Tex. 828; (43) Okla. 32; (45) Guam 34; (49) Kans. 427.
yields, (41) Mo. 637; (43) Ariz. 733; (46) Mo. 326.
- Kail, yield tables, (43) 840.
- Kainit—
and potash, comparison, (44) 515.
fertilizing value, (41) Ala.Col. 336; (43) 630; (46) 626; (49) 623, 825.
injury to crops, (44) 817.
use in conservation of liquid manure, (42) 721.
value in weed control, (41) 538.
- Kakataraballi, identity, (46) 843.
- Kala azar, studies, (41) 781.
- Kale—
analyses, (43) 63.
and cabbage hybrids, (50) 633.
as affected by sulphur, (50) Oreg. 724.
boom for spraying, description, (42) Va.Truck 893.
cost of spraying, (44) Va.Truck 159.
culture, (49) West.Wah. 395.
culture experiments, (49) Alaska 435.
fertilizer experiments, (47) Wash. 124; (50) West.Wash. 520.
Fusarium wilt, notes, (47) Calif. 646.
hardening process in, (46) Mo. 827.
home-grown, (47) West.Wash. 898.
iron content, (48) 159.
marrow-stemmed, feeding value, (47) 671.
nutritive value, (41) 557.
paper on, (43) Wash. 197.
seed growing, (45) 44.
- Kalikalk v. potassium sulphate, tests, (42) 221.
- Kallosysphinga—
dohnii, paper on, (42) 748.
spp., notes, (41) 759.
- Kalmia microphylla*, poisonous to livestock, (43) Nev. 273.
- Kalotermes*, new species, (43) 256.

- Kamala, powdered v. fluid, taeniadical value, (43) 381.
- Kangaroo rat, life history, (48) U.S.D.A. 249.
- Kangkong leaves, vitamin C in, (49) 563.
- Kansas—
- College, notes, (41) 300, 497, 700, 898; (42) 300, 497, 600, 695, 797; (43) 199, 497, 599, 699, 799; (44) 298, 496, 797; (45) 95, 300, 498; (46) 195, 395, 794; (47) 98, 498, 600, 899; (48) 98, 299, 499, 898; (49) 98, 299, 397, 697; (50) 299, 396, 697.
 - horse disease in Colorado, (44) 280.
 - State institutions of higher learning, survey, (50) 194.
 - Station, notes, (41) 497; (42) 300, 600, 695; (43) 199, 497, 599, 799; (44) 298, 797; (45) 95, 300, 498; (46) 195, 794; (47) 98, 498, 600, 899; (48) 499, 898; (49) 98, 397, 697; (50) 697.
 - Station, report, (41) 98; (44) 297; (46) 498; (49) 495.
- Kanyin, properties and uses, (49) 43.
- Kaoliang—
- culture experiments, (44) N.Dak. 524; (47) U.S.D.A. 330.
 - field tests, (41) N.Dak. 824.
 - kernel-smut resistance, (41) Kans. 48.
- Kaolin—
- analysis, (49) 414.
 - decomposition, (49) 212.
 - dust mixtures, value, (44) Calif. 744.
 - for tannin analyses, (41) 805.
 - origin in middle Germany, (46) 219.
- Kaolung, analyses, (44) Calif. 768.
- Kapok—
- culture experiments, (45) 34.
 - culture in Ceylon, (41) 529.
 - industry in Philippines, (49) 132.
 - production in French Africa, (42) 230.
 - properties and uses, (50) 534.
 - seed meal, analyses, Ind. (41) 564, 868.
- Karanja cake, fertilizing value, (41) 816.
- Karbos, decolorizing carbon, production, (44) 808.
- Karite, production in French colonial possessions, (42) 32.
- Karnya weigeli n.g. and n.sp., description, (48) 457.
- Karoo, famine fodder for, (49) 265.
- Katabolism, basal, studies, (43) 372.
- Katathermometer for measuring bodily comfort, (44) U.S.D.A. 416.
- Katoka tree, description, (47) 129.
- Kauri forests, management, (41) 46.
- Kauri gum industry in New Zealand, (43) 43.
- Kava, culture experiments, (45) 34.
- Kawai, culture experiments, (45) 34.
- Keawe bean meal, value for work animals, (45) 573.
- "Keel," use of term, (42) 779.
- Kefir, preparation, (42) U.S.D.A. 363.
- Keithia thujina, notes, (43) 49; (45) 548.
- Kelp—
- carbon monoxid in, (44) 28; (45) 125.
 - decolorizing carbon, (41) La. 416.
 - distillates, nature and composition, (44) 23.
 - distillation at low temperatures, (43) 630.
 - industry, history, (50) 123.
 - potash from, (46) 23; (48) 713; (50) U.S.D.A. 424.
 - production, (42) 20.
 - utilization, (41) 508, 518.
- Kelpchar as decolorizing agent, (47) 410.
- Kentucky—
- Station, notes, (41) 497, 700, 898; (42) 497, 797; (43) 299, 497, 899; (44) 96, 396; (45) 699; (46) 395; (47) 99, 197, 800; (48) 299; (49) 98, 397; (50) 96.
 - Station, report, (43) 397, 898; (46) 297, 898; (48) 193; (49) 599.
 - University, notes, (41) 497, 700; (42) 497, 797; (43) 299, 899; (44) 396; (45) 699; (47) 197, 600; (48) 796; (49) 397; (50) 96.
- Keratin, hydrolyzed, effect on growth of horny tissue, (45) 468.
- Keratitis, contagious, (44) 280.
- Keratomalacia—
- fatal in an infant, (50) 772.
 - in rats, studies, (44) 262.
 - nutritional, in infants, (46) 63.
- Kermes—
- hymenopterous parasites, notes, (42) 159.
 - parasite, (41) 164.
- Kernels—
- analysis, (44) 412.
 - standards for, (44) 413.
- Kerosene—
- analyses, (44) 586; (45) 392.
 - analyses, official, (43) 790.
 - and gasoline carburetion, experimental survey, (49) 85.
 - as fuel for high-speed engines, tests, (42) 586.
 - as fuel for tractors, (42) 184; (43) 891.
 - as preservative of urine, (42) 428.
 - emulsion as soil insecticide, (44) 852.
 - emulsion, insecticidal value, (41) Conn.State 158, 162; (45) N.C. 362; (48) Ky. 357.
 - injury to shade trees, (43) 732.
 - inspection and analyses, (43) 187, 790.
 - motor fuel and lubrication, (47) Wis. 488.
 - oil, burning in house-heating boilers, (49) 185.
- Kerosene-fusel oil emulsion, preparation, notes, (45) V.I. 150.
- Kerosene-gasoline mixtures, flash and burning points, (46) 490.
- Kestrel, food habits, (41) 454.

- Ketones, hydrolysis in presence of, (49) 11.
- Kharwas, making and use in India, (42) 563.
- Khawa, making and use in India, (42) 563.
- Kid fat, digestibility, (41) U.S.D.A. 65.
- Kid meat, digestibility, (44) 661.
- Kidney—
and liver, relationship, (44) 374.
disease in Tropics, (42) 554.
structure during underfeeding, (42) 665.
worm of hogs, (48) 679; (49) 787; (50) 586.
- Kidneys—
changes in deficiency disease, (43) 664.
effect of high protein diet, (50) 162.
excretion of insulin by, (50) 864.
insulin-like substance in, (50) 864.
zinc content, (45) 64.
- Kieselguhr—
for cane juice clarification, (46) 508.
for fruit juice clarification, (46) U.S.D.A. 616.
- Kikuyu grass—
adaptation and behavior, (48) Calif. 527.
as smother crop for bracken fern, (49) 33.
blotch, (46) 544.
- Kiln drying handbook, (49) U.S.D.A. 386.
- Kiln for lumber drying, design, (44) U.S.D.A. 286.
- Kingfisher, white-collared, revision of subspecies, (42) 847.
- Kisso, feeding value, (49) 72.
- Kitchens—
design and equipment, (46) U.S.D.A. 89.
farm, arrangement, (44) 689.
- Kites, directions, (44) 494.
- Klein disease, treatment, (50) 82.
- Knemidocoptes mutans, control, (45) Mont. 586.
- Knitting, energy expenditure during, (44) 66.
- Knopderm in sheep, (41) 873.
- Koa tree, description and uses, (42) 739.
- Kohl-rabi—
analyses, (43) 63.
as affected by carbon dioxide, (44) 725.
culture experiments, (41) 737; (48) V.I. 340.
early growth in alkali soil, (42) Utah 28.
inheritance of head and root formation, (45) 345.
meal, feeding value, (42) 369.
root development, (43) 834.
root tumor, notes, (44) 643.
seed production, (45) 740.
variety tests, (48) 32.
waste, feeding value, (42) 369.
weeding experiments, (41) 737.
- Kokia spp. of Hawaii, (41) 541.
- Koleroga, eradication, (45) 48.
- Koufri, effect on nitrification in soil, (50) 721.
- Koufri, fertilizing value, (48) 819.
- Kraal manure, fertilizing value, (46) 818.
- Kryptocyanins, (44) 802.
- Kudzu—
as forage crop, (43) Ariz. 734.
characteristics and uses, (48) 435.
culture and uses, (43) U.S.D.A. 334.
feeding value, (43) La. 670.
notes, (48) Guam 228.
plants, root formation, (48) Hawaii 330.
- Kuehneola desmium notes, (48) 45.
- Kumquat—
culture experiments, (49) Tex. 436.
disease, new, (48) 746.
- Labena n.spp., description, (43) 857.
- Labenidae—
new family in Ichneumonoidea, (42) 456.
notes, (43) 60.
- Labenidea, new genus, erection, (43) 857.
- Labor—*see also* Agricultural labor.
income, factors affecting, (49) Miss. 488.
income from crops v. pasture, (43) 92.
income from farms of different types, (43) W.Va. 92, 291.
income from Missouri farms, (45) 86.
income from North Carolina farms, (47) U.S.D.A. 892.
income from poultry farms, (49) 593.
income of farmers, surveys, (42) Wis. 391.
income on farms, (45) Idaho 189; (47) Miss. 294.
income on farms in Pennsylvania, (43) U.S.D.A. 692.
income on farms near Washington, D. C., (43) U.S.D.A. 692.
income on irrigated farms, (47) Mont. 491.
movement and the farmer, (48) 190.
saving devices in sugar industry, (42) 284.
saving in sugar beet fields, (41) U.S.D.A. 337.
- Laboratory ware, palau and rhotanium, (41) 11.
- Laboratory work, aims and value, (49) 596.
- Laborers, farm, *see* Agricultural labor.
- Lac—
cultivation and storage, (45) 861.
culture in India, (45) 657; (49) 851.
industry in India, (42) 647.
insects, emergence of larvae, (47) 358.
insects in United States, (41) 457, 757.
notes, (45) 359.
- Lace bug on hawthorn, studies, (42) 749.
- Lachnea cocoas, notes, (47) 547.
- Lachiniella, genotype for, (41) 757.
- Lachnoidius phoradendri, synonymy, (41) 757.

Lachnopus coffeae—

- montanus* n.subsp., notes, (49) 550.
- n.sp., notes, (49) 550.

Lachnosterna—see also May beetle, June beetle, and *Phyllophaga*.

- antiquae*, life history, notes, (46) 559.
- lanceolata*, studies, (41) 166.
- spp., control, (48) Fla. 251; (49) 549.
- spp., life histories, (43) 760.
- spp., notes, (41) 666; (44) Kans. 249; (47) 847; (49) Miss. 454.

Lachnus—

- genotype for, (41) 757.
- pineti*, production of melezitose by, (42) 311.
- pini*, notes, (48) 253.
- strobi*, notes, (43) 556.

Lactalbumin—

- growth-promoting value, (41) 465, 466.
- hydrolysis, monamino acids in, (46) 503.
- nutritive value, (44) 463.
- soluble, from whey, (49) 312; (50) 280.
- tryptophan determination, (49) 714.

Lactase in intestine of calf fetus, (44) 864.*Lactation*—

- curve, shape of, (49) 876.
- effect on sexual cycle in rats and guinea pigs, (46) 871.
- relation to embryonic development, (41) 862.

Lactic acid—

bacteria—

- biology, (45) 476; (47) 79, 282; (48) 275.
- casein-splitting capacities, (44) 273.
- growth rate, (44) 272.
- inoculation of corn silage with, (44) 175.
- monograph, (43) 680.
- physiological mutations in, (45) 380.
- relation to corn silage, (45) 502.
- detection, (44) 113.
- determination, (41) 112; (47) 716.
- determination in blood, (45) 15.
- effect on heat production, (42) 259.
- effect on molds, (45) 463.
- effect on swine, (42) 266.
- in milk, germicidal effect of, (43) Conn. Storrs 768.
- in sour milk, (41) N.Y.State 201.
- milk for infant feeding, (44) 64.
- oxidation in milk analysis, (42) 112.
- producing organisms and preparations, (43) 470.
- production as affected by bacteria, (43) N.Y.State 681.
- production from corncobs, (45) 510.
- qualitative detection, (48) 111.
- refined, use in food products, (43) 366.
- streptococcus*, differentiation from pyogenes type, (42) 773.

Lactic acid—Continued.

- type produced by starters, (46) Iowa 77.

Lactic—

- fermentation, studies, (47) 282.
- silage, studies, (45) 468.
- starter, *Streptococci* in, (46) 76.
- starters, volatile acidity of, (43) Iowa 75.

Lactobacilli in corn meal, (46) 356.*Lactobacillus*—

- acidophilus*, culture media for, (47) 583.
- arabinosus*, suggested name, (46) 503.
- pentoaceticus*, fermentation of hexoses by, (43) 610.
- pentoaceticus*, fermentation of xylose by, (41) 614; (45) 220.
- pentoaceticus* n.sp., studies, (42) 709.
- pentoaceticus*, suggested name, (46) 503.
- pentosus*, suggested name, (46) 503.
- Lactococci*, casein-splitting capacities, (44) 273.

Lactose—

- crystallization in sandy ice cream, (50) Minn. 179.
- determination, (42) 416.
- determination—
 - by Barfoed's solution, (45) 806.
 - in altered milk, (43) 14, 505.
 - in blood, (45) 110.
 - in milk, (41) 115, 505.
 - methods, (45) 12, 13, 615.
- effect on intestinal flora, (43) Conn. Storrs 768.
- effect on reaction of feces, (48) 63.
- extraction from whey, (49) 312; (50) 280.
- fermentation products, (48) 108.
- growth-promoting value, (41) 466.
- in milk, determination, (50) 614.
- in milk, polarimetric determination, (43) 805.
- in milk, polariscopic determination, pipette for, (50) 714.
- in presence of other sugars, determination, (46) 311, 807.
- oxidation in milk analysis, (42) 112.
- propionic acid fermentation, (50) 109, 205.

Ladybird beetles—

- attacking prune scale, (43) 252.
- collection and storage, (43) 559.
- for aphid control, (41) 62.
- for citrus white fly control, (42) 455.
- hibernating habits, (42) 252.
- notes, (42) 158.
- of Florida, (47) 555.
- storage experiments, (41) 666.

Ladybird, South African, introduction into California, (50) 661.

- Laelius utilis*, description, (42) 751.
- Laemophloeus minutus*, notes, (41) 759.
- Laestadia camelliae*, notes, (47) 754.
- Laestadia cocophila*, notes, (47) 547.

Laetilia coccidivora, notes, (48) U.S.D.A. 458.
Lagerstroemia flos-reginae, notes, (44) 149.
Lagerstroemia species, description, (46) 41.
Lagochirus araneiformis, notes, V.I. (45) 150; (50) 555.
 Lahaina cane disease, notes, (42) 150, Hawaii 352.
 Lahaina cane, nematode injury, (42) 150.
 Lake brines as source of potash, (41) 518, 818.
 Lakes, algae growths in, prevention, (47) 590.
 Lalang grass as a paper material, (41) 532.
Lamb—
 and lamb products as food, gastric response to, (41) 857.
 cold storage holdings, (49) U.S.D.A. 893.
 dressing and cutting on the farm, (46) Iowa 477.
 frozen, British trade in, (47) 275.
 trade, British imports, (42) 867; (44) 866.
 use in diet, (49) U.S.D.A. 660.
Lambs—*see also* Sheep.
 as affected by iodine feeding of ewes, (41) Iowa 286.
 beet by-products for, (45) Colo. 269.
 birth weights and growth, (50) Can. 469.
 castrating and docking, (44) U.S. D.A. 73.
 cholera studies, (42) 179.
 comparison of types, (50) Ohio 270.
 corn for fattening, (44) Ohio 365.
 cost of feeding, (50) Can. 469.
 digestion and nitrogen balance trials, (46) 67.
 docking and castrating, Pa. (47) 473; (49) 269.
 docking, searing iron v. knife, (43) Tex. 870.
 early spring, production, (48) 475.
 fattening, (44) Pa. 770, 869; (45) Nebr. 574; (49) Iowa 870.
 fattening, shelter v. open lot, (44) Oreg. 471.
 feeding and care, (49) 297.
 feeding experiments, (41) Ind. 70, Kans. 71, Ohio 568, Nebr. 770, 771; (42) Kans. 372, Calif. 868; (43) Ind. 375, Can. 772, Wash. 772; (44) Ind. 365; (45) Tex. 69, Wis. 269, Okla. 376, 471, U.S.D.A. 574, Idaho 674; (46) Oreg. 170, N.Mex. 365, Tex. 365, Ind. 477, 676; (47) 75, Wyo. 170, Mich. 175, Tex. 473, Wyo. 572, Nebr. 775; (48) N.Dak. 269, Wash.Col. 269, Idaho 570; (49) Iowa 571, Nebr. 670, Nebr. 773, 774, Nebr. 774, 870; (50) N.Mex. 65, Oreg. 66, Tex. 66, 271, Can. 271, Nebr. 271, 573, 574.
 feeding, hand v. self-feeding, (45) Kans. 574.

Lambs—Continued.

 forage crops for, (41) Ohio 177, 368; (44) 365.
 growth as related to quantity and composition of ewe's milk, (41) 176.
 growth, relation to fat content of ewes' milk, (43) N.H. 172.
 infection with swine erysipelas, (44) 583.
 killing, dressing, and cutting, (49) 67.
 losses in feed lots, (47) Colo. 72.
 marketing, (50) Oreg. 66.
 protection from stomach worms, (48) 380.
 raising, (47) 867.
 raising in New South Wales, (50) 271.
 raising to market age, cost, (50) Can. 271.
 self-feeders for, (41) Nebr. 770, 772.
 shearing before marketing, (41) Ind. 70.
 size at birth, (50) 869.
 systems of production, (50) Ohio 270.
 tapeworms in, (48) 678.
 time of breeding, (50) Can. 469.
 twins and single, growth data, (43) N.H. 172.
 twins, factors affecting production, (46) U.S.D.A. 170.
 urinary calculi in, (47) Iowa 772.
 vetch seed for, (43) 373.
 western, fattening, Ind. (48) 268; (50) 369.
 wheat straw for, (45) Kans. 267.
 wintering, (44) 869; (50) Minn. 170, Mont. 171, 574.
 wool as affected by thyroidectomy, (46) 72.
Lamb's quarters downy mildew, notes, (44) 48.
Lamellicornia of British India, (43) 50.
Laminaria—
 digitata as famine food, (50) 561.
 flexicaulis, notes, (43) 775.
 injury and recovery, mechanism and theory, (48) 125, 126.
 mechanism of injury and recovery of cell, (45) 527.
Laminitis of the horse, (44) 583.
Lamium amplexicaule, cause of staggers, (49) 178.
Lamp for taxonomic work in entomology, (47) 51.
Lampronia *melancholica*, parasitism by, (44) 258.
Lamziekte—
 cause of, (42) 477.
 in cattle, (41) 873.
 notes, (48) 181.
 relation to *Sarcosporidia*, (44) 79.
Land—
 acts, British, (44) 487.
 acts, Irish, (41) 293.
 allotment methods in Burma, (49) 389.

Land—Continued.

- allotments in England and Wales, (46) 591.
- and labor in India, (43) 293; (47) 796.
- bank bonds, joint-stock, (50) 593.
- clearing, (42) 95; (44) 198, Wis. 284, Wis. 685; (48) Minn. 384; (49) Wis. 687.
- clearing—
 - engineering developments in, (46) 98; (50) 99.
 - engineering features, (47) 187.
 - forced v. delayed systems, (43) Minn. 480.
 - horsepower v. dynamite, (43) Minn. 888.
 - in British Columbia, (45) 891.
 - methods, (47) Ala.Col. 887; (48) Oreg. 587.
 - progress and status, (48) 196.
 - use of explosives in, (42) 183, Wis. 384, Minn. 888; (43) 480; (45) Ala.Col. 81.
 - use of salt and sulphur in, (43) 281.
 - use of TNT in, (42) 278; (43) U.S.D.A. 282.
- continuously cropped to hay, rejuvenation, (49) N.H. 328.
- credit, *see* Agricultural credit.
- cut-over, *see* Cut-over land.
- development and settlement in Palestine, (50) 792.
- development, suburban, rôle of gardening in, (42) 444.
- economics, outlines, (41) U.S.D.A. 292.
- economics, outlines, treatise, (48) 787.
- grant colleges, *see* Agricultural colleges.
- grant institutions, tendencies and problems, (49) 596.
- holding and labor supply in colonial Virginia, (48) 790.
- holding in California, (42) 490.
- holding in France, historical study, (42) 490.
- holding systems in Algeria, (50) 793.
- holdings—
 - consolidation in India, (47) 492.
 - expropriation in Italy, bill for, (49) 891.
 - in India, regrouping, (41) 491.
 - in Roumania, (44) 488.
 - rural, for Paraguay, (48) 491.
 - rural small, facilities for acquisition in France, (49) 891.
 - small, building requirements in England, (45) 83.
 - small, in central Italy, formation, (50) 90.
- in Bavaria, economic rearrangement, (47) 691.
- in California, irrigation requirements, (50) 84.

Land—Continued.

- in central Europe, laws affecting, (41) 693.
- in Denmark, use, (50) 792.
- in Great Britain as national property, (45) 593.
- lease contracts, protection, (47) 691.
- leases, (46) Ohio 394.
- mortgage credit, cooperative, for India, (43) 192.
- nationalization in England, (42) 391; (47) 192.
- nationalization, treatise, (49) 389.
- ordinances, early Federal, educational significance, (48) 691.
- ownership, difficulties and aid to farmer, (45) U.S.D.A. 795.
- ownership of farms, (46) 893.
- plaster, *see* Gypsum.
- policies, international phases of, (42) 287.
- policy, American, (45) 394.
- prices and speculation, (47) Ky. 795.
- problems of new era, (48) 593, U.S.D.A. 890.
- reform, effect on cereal acreage in Bulgaria, (48) U.S.D.A. 529.
- reform in Czechoslovakia, (49) 891.
- registration, Torrens system, (42) 291.
- rent and taxation, (45) 895.
- resources of British Empire, development, (48) 891.
- revenues in Great Britain, (50) 544.
- settlement—*see also* Agricultural colonization and Colonization.
 - and tenure in Australia, (48) 894.
 - colony system, (42) 688.
 - cooperative, (48) 389.
 - for British ex-service men, (42) 89.
 - for service men, (41) 193, 489, 591, 592, 792, 889.
 - for service men in Germany, (44) 289.
 - in California, (41) 91, 489; (43) 393; (45) 192, 493.
 - in California, Calif. (41) 91; (44) 289, 788; (48) 593.
 - in Canada for ex-service men, (43) 93.
 - in Denmark, (43) 487.
 - in Great Britain, (42) 391.
 - in Italy for ex-service men, (43) 93.
 - in Minnesota, (41) Minn. 91; (44) Minn. 787; (45) 795; (47) Minn. 392.
 - in New South Wales, (43) 191; (44) 788; (45) 395; (46) 389.
 - in New Zealand, (42) 90; (43) 491; (50) 693.
 - in Oregon, (41) 92.
 - in Queensland, (41) 792.
 - in Queensland for ex-service men, (43) 93.
 - in Scotland, (45) 593.

Land—Continued.

- settlement—continued.
 - in Union of South Africa, (42) 791; (44) 492.
 - in United States, (41) 889; (43) 487.
 - papers on, (48) Calif. 187.
- situation in England, (50) 199.
- speculation, (43) 793.
- surveying, instruction in Prussia, (44) 596.
- surveys in Philippines, (47) 595.
- system and national food supply in Great Britain, (50) 391.
- system of Texas, history, (42) 190.
- tax in England and Scotland, (44) 90.
- taxation, (47) 692.
- taxes in China, policies, (42) 491.
- tenancy—
 - in Argentina, (46) 293.
 - in Italy, (45) 596.
 - in Texas, (47) U.S.D.A. 691.
 - share, in Spain, (50) 91.
 - types, relation to types of farming, (49) Iowa 793.
- tenure—
 - and customs in the Sudan, (46) 591.
 - and transfer in Scotland, (46) 785.
 - community phases, (50) Nebr. 290.
 - ideal system, (41) 292.
 - in American colonies, (43) 694.
 - in Australia, (46) 895; (48) 894.
 - in Bolivia, (47) 93.
 - in Cotton Belt, (46) 189.
 - in Federated Malay States, (47) 796.
 - in France, (41) 490, 791.
 - in France, development, (43) 487.
 - in Germany, (42) 687.
 - in Ireland, (48) 187.
 - in Italy, (44) 191, 591.
 - in Kansas, (41) Kans. 791.
 - in Minnesota, (41) Minn. 93.
 - in Missouri, (45) Mo. 292.
 - in Nebraska, (41) 387.
 - in New Zealand, (42) 90; (43) 491; (50) 693.
 - in Palestine, (41) 891.
 - in Russia, (42) 894.
 - in South Africa, (42) 688, 791.
 - in Texas, (41) 591.
 - in Union of South Africa, (44) 492.
 - in Wisconsin, (44) Wis. 289.
 - problem, treatise, (41) 387.
 - security for allotment holders, (50) 890.
 - share-rent system, (41) 592.
 - share rental demands, (44) 891.
 - share rental determination, (43) 489.
 - studies, (41) 891; (42) 689; (49) Nebr. 189.

Land—Continued.

- tenure—continued.
 - systems, comparison, (43) Mo. 190.
- unproductiveness, due to toxic substances from mines, (44) 223.
- utilization, national policy, (47) 297.
- valuation—
 - and property tax in Austria, (42) 88.
 - in rural France, (47) 893.
 - manual of rural appraisement, (49) 90.
 - problems, (47) 692.
- values—
 - and fertilizers, (49) 792.
 - in France, (42) 688; (44) 388.
 - in Iowa, (43) 593, U.S.D.A. 893.
 - in Iowa and land and labor profits, (47) 392.
 - in Lombardia, (47) 192.
 - in Sweden, (43) 594.
 - in Tasmania, (42) 894.
 - progressive tax on, (47) 93.
 - relation to income, (44) 592.
 - unimproved, proposed tax on, (46) 592.
- Landowners, British—
 - laws affecting, (47) 492.
 - relation to agricultural industry, (50) 792.
- Lands—
 - arable, in United States, (41) U.S.D.A. 693.
 - arid grazing, of Southwest, tenure, (46) U.S.D.A. 784.
 - arid, reclamation in Wyoming, (49) 483.
 - bad, biotic succession in, (49) 30.
 - classification, (41) 839; (45) 745.
 - classification in southern Minnesota, (41) 212.
 - farm, available for settlement, (48) U.S.D.A. 293.
 - forest, *see* Forest.
 - government, homesteading, (46) 91.
 - newly broken, clover and timothy for, (41) Idaho 226.
 - public, and immigration laws of Bolivia, (43) 94.
 - public, disposition, in United States, (42) 88.
 - public, in Oregon and Washington, (42) 288.
 - reparceling, (48) 615.
 - sandy, *see* Sand and Sandy.
 - swamp, *see* Swamp.
 - uncultivated, economic utilization, (49) 709.
 - unused in United States, reclamation, (43) 123.
 - washed, of Indiana, (41) Ind. 130.
 - waste, conversion into meadow, (41) 231.
 - waste, reclamation, (44) 293, 509.
 - waste, reclamation in India, (43) 150.

- Landscape gardening—*see also* Gardening, ornamental.
treatise, (42) 539; (45) 441; (46) 236; (47) 746.
- Languria mozardi, *see* Clover stem borer.
- Lantana—
fly, studies, (42) 158.
insects in India, (44) 57; (45) 657.
- Lanthanum, antagonistic actions, (48) 124.
- Lanzon, improvement, (48) 839.
- Laphygma—
exempta in Queensland, (46) 658.
exigua on tobacco, (43) 52.
frugiperda, *see* Army worm, fall.
- Lapwing, food habits, (41) 454.
- Larch—
as nurse crop, (49) 743.
canker, notes, (44) 347.
case bearer, notes, (42) 157; (50) 844.
Chermes, life history, (43) 54.
diseases in Switzerland, (42) 50.
Dukeld hybrid, history of, (42) 142.
European, culture in New Zealand, (49) 837.
evolution of vacuolar system in, (44) 822.
for wood-block pavement, (41) 790.
fungal diseases, notes, (44) 347.
growth as affected by locality, (43) 748.
in Swedish forest economy, (41) 345.
insects affecting, (50) 153.
Japanese, new disease, (47) 154; (49) 445.
Japanese, Phomopsis disease of, (49) 446.
longicorn beetle, summary, (50) 848.
needle-cast fungus, studies, (46) 554.
rusts of, (41) 353.
sawfly, control, (50) 844.
sawfly, large, studies, (49) 454.
seedlings, fungus attacking, (43) 49.
species, comparative growth data, (43) 43.
ties, volume table, (42) 240.
time of planting test, (48) 240.
turpentine from western larch, (45) 416.
western—
alcohol production from, (48) 416.
growth measurements, (43) 43.
in cultivation, (47) 539.
uses and stresses, (44) 149.
wood analysis, (42) 7.
wood, penetration by creosote, (41) 820.
- Lard—
adulteration, detection, (47) 806.
analysis, (45) 806.
cold storage holdings, (49) U.S.D.A. 893.
detection of suet in, (45) 315; (46) 14, 311.
detection of vegetable oils in, (48) 206.
international trade, (46) 675.
- Lard—Continued.
rancidity in, factors affecting, (48) 414.
shortening value, (46) 258.
storage holdings, (41) U.S.D.A. 558.
substitutes, effect on hog prices, (44) U.S.D.A. 389.
substitutes, use, (45) U.S.D.A. 294.
vitamin A in, (43) 764; (45) 566.
vitamin A in, effect of hog feed, (49) 59.
vitamin content, (46) 259.
- Laris eurolepis, history of, (42) 142.
- Larkspur, poisonous to livestock, (42) 879; (45) Ariz. 479, Wyo. 479; (49) Nev. 583.
- Larkspur, tall, identification, (42) 776.
- Larkspur, toxicity, (41) Wyo. 407.
- Larus hyperboreus barrovianus, status, (41) 846.
- Lasiobotrys sp. on Brie cheese, (42) 877.
- Lasioderma serricorne, *see* Cigarette beetle.
- Lasiodiopodia theobromae—
n.sp. on cacao, (42) 46.
notes, (45) 653; (46) 44, 45; (47) 547; (49) 540; (50) 248.
- Lasiophthicus pyrastris, notes, (50) 156.
- Lasiosphaeria pezizula, stain produced by, (48) 649.
- Lasius niger, notes, (46) 51.
- Lasogrostis splendens, notes, (42) S.Dak. 827.
- Laspeyresia—
conicolana, occurrence and habits in France, (47) 553.
leucostoma on tea, (47) 658.
molesta, *see* Peach moth, oriental.
nigricana, life history and control, (44) 252.
nigricana, life history notes, (43) 850.
novimundi n.sp., description, (44) 252.
novimundi, studies, (45) 154.
pomonella, *see* Codling moth.
- Laterite soils of Formosa, (47) 514.
- Laterite soils of Goa, (49) 16.
- Latex formation in Hevea, (42) 144.
- Lath production in 1918, (43) U.S.D.A. 150.
- Lathraea spp., nutrition and reproduction, (44) 133.
- Lathyrus spp., chromosome number in, (43) 632.
- Lathyrus spp., studies, (42) 128.
- Laundering—
home, methods and equipment, (43) U.S.D.A. 792.
principles, (45) 697.
treatise, (50) 797.
- Laundries, cooperative, in United States, (49) 391.
- Laurel—
as affected by chloropicrin, (45) 28.
poisonous to livestock, (42) 879; (47) Nev. 786.
silver-leaf, notes, (49) 845.
- Lavala eradication, (50) 238.

Lavender—

culture and preparation of products, (50) 140.

diseases in England and Wales, (49) 645.

industry in France, (44) 45.

Law, J., biographical sketch, (44) 799.

Law of diminishing returns, application, (49) 89.

Lawn and garden competitions, (42) U.S.D.A. 346.

Lawn grass—

glucokin in, (50) 765.

mixtures, inspection, (41) N.J. 40.

seed mixtures, tests, (50) 740.

Lawn—

grasses for South China, (43) 441.

insect, notes, (46) 659.

mower clippings, feeding value, (47) Md. 73.

pennywort, eradication, (45) U.S.D.A. 43.

Lawns—

injury from mole crickets, (43) 53.

making and maintaining, (42) U.S.D.A. 346.

paper on, (43) Wash. 197.

Rhizoctonia in, (42) 243.

spraying experiments, (43) N.Y.State 535.

Lead—

action of water on, (43) 279.

and zinc as pigments, tests, (42) 591.

arsenate—

action of soap upon, (49) 553.

analyses, N.J. (43) 37; (44) 440.

and leaf roller, (50) 844.

colloidal, preparation and properties, (50) 608.

effect on foliage, (49) 750.

electrolytic preparation, (47) 712.

for codling moth control, (41) 460.

for fruit tree leaf roller, tests, (49) Mont. 852.

fungicidal value, (41) Ill. 146; (43) Mass. 155; (44) 246.

injury to foliage, (47) Mass. 646.

insecticidal value, (41) Wis. 661;

(43) Colo. 158, Oreg. 755; (44) Mich. 144, U.S.D.A. 456, U.S.

D.A. 460; (46) Mich. 443, N.J. 556; (49) 759.

physical properties, (47) 711.

powdered v. paste, (41) 160.

preparation, (46) U.S.D.A. 235.

properties, (44) Oreg. 850; (49) U.S.D.A. 448.

spraying tests, (45) Mo. 252.

triplumbic form, (41) Mo. 650.

use against tobacco hornworm, (50) U.S.D.A. 53.

use with Bordeaux, (41) 533.

use with lime-sulphur, (41) Ill. 750; (42) 748.

water-soluble arsenic in, expression, (50) 205.

compounds, stimulating effect, (49) 23.

Lead—Continued.

contamination of cistern water, (47) 790.

determination, (41) 413, 713.

determination in biological material, (49) 113, 114.

determination in cassia oil, (43) 14.

effect on wheat, (50) 820.

extracted from glaze, (42) 164.

in lead arsenate, determination, (50) 196.

microchemical detection, (50) 613.

nitrate, effect on crops, (44) 819.

nitrate, use in clarification of sugar solutions, (47) 112.

oxid, insecticidal value, (49) U.S.D.A. 449.

poisoning in waterfowl, (41) U.S.D.A. 581.

red, use in paint, treatise, (46) 688.

salts, effect on bacteriological analysis of water, (49) 285.

salts, soluble, effect on plants, (50) 221.

sulphates, effect on alkali salts, (42) Calif. 813.

white, use as solid lubricant, (49) 888.

Lead-cable borer. biology and control, (48) U.S.D.A. 555.

Leaf—

anatomy of alpine and plains plants, (42) 432.

blister mite, notes, (43) 252.

bugs, notes, (47) 756.

cast, studies, (42) 130, 334.

crumpler in South Dakota, (41) 59.

miner injurious to honeysuckle, (42) 250.

miners, contact sprays for, (45) N.H. 156.

moth, small, on coconut, (46) 247.

nematodes, control, (45) 851.

roll and leptonecrosis, relation, (46) 649.

Leaf roller—

Colorado, in Montana, (45) 855.

control, (42) 153; (49) Wash.Col. 251.

control, papers on, (47) 849.

four-banded, life history studies, (50) Pa. 454.

red-banded, life history studies, (50) Pa. 454.

red-banded, studies, (44) U.S.D.A. 458.

Leaf—

scorch, notes, (49) 48.

spot disease, bacteriolytic action, (46) 44.

spot fungus, (45) 849.

temperature, determination, (44) 131.

thrips, control, (47) 53.

tissues, temperature, method of determining, (42) 628.

Leafhoppers—

control, (47) 53, 253; (49) 654.

in Hawaii, (45) 551.

injurious to apple nursery stock, (42) U.S.D.A. 358.

Leafhoppers—Continued.

- injurious to woodbine, (47) 54.
- notes, (49) Oreg. 555.
- of genus *Gypona*, (41) 456.
- of Hawaii, (42) 150.
- of New Zealand, notes, (42) 249.
- of Nova Scotia, (41) 849.
- of South Carolina, (42) S.C. 56.
- on avocado, control, (43) 255.
- on potato, relation to tipburn, (43) 345.
- papers on, (50) 844.
- parasites of, (42) 53; (44) 550.
- smallest known, description, (45) 360.
- transmitting curly top, duration of virulence, (43) 752.
- use of trap for control, (45) 254.

Leaf-skin theory of the stem, (48) 728.

Leather—

- analysis, official method, (44) 9.
- belting specifications, (49) 590.
- belting, tests of flesh and grain sides, (49) 486.
- care of, (44) U.S.D.A. 586.
- chemistry, laboratory manual, (43) 317.
- chemistry of, (41) 614; (43) 617.
- determination of water-solubles in, (41) 506.
- fertilizing value, (44) 512.
- harness, physical properties, (43) 892.
- home tanning, U.S.D.A. (47) 781; (49) 717.
- industry, anthrax prophylaxis in, (46) 682.
- international trade, (46) 675.
- manufacture, treatise, (46) 313; (47) 509.
- meal as source of nitrogen, (42) 522.
- moisture determination in, effect of humidity, (46) 205.
- nitrification, (41) 517.
- oil and grease extraction from, (46) 114.
- refuse, analyses, (43) 28.
- use of sharks' skin for, (42) 659.
- waste, utilization, (41) 723.
- water extraction from, (46) 114.
- wearing qualities, (49) U.S.D.A. 717.

Leatherjackets, injury and control, (42) 455.

Leavens, action and measurement, (47) 503.

Leaves—

- absorption of solar energy by, (42) 730.
- acid formation relation to nitrogenous material, (44) 825.
- aeration systems, (47) 628.
- anthocyan and respiratory exchanges in, (42) 129.
- anthocyanin in, localization, (43) 327.
- area determination, (47) 224.
- area of vein islets as age determinant, (48) 728.
- carbon dioxid absorption, (45) 219.
- carotin and xanthophyll in, (43) 633.
- color changes in life course, (43) 729.

Leaves—Continued.

- coloration and fall, effect of weather, (50) 324.
- dead, toxic action on germination, (46) 813.
- dried, fertilizing value, (41) 814.
- effect on shoot formation, (41) 526, 727.
- evergreen, changes in reserve materials, (43) 29.
- evergreen, fat storing by, (42) 433.
- excretions from, factor in arsenical injury, (50) 525.
- feeding value, (42) 769.
- forest, insulating value, (44) 588.
- green, light absorption by colorants of, (42) 730.
- in autumn, amino acids in, (47) Minn. 348.
- in sun and shade, carbohydrate production, (49) 728.
- manganese in, variations with age, (50) 221.
- morphological studies, (44) 628.
- mottling of, studies, (48) 525.
- of crop plants, temperature, (50) 425.
- of desert plants, size and form, (45) 335.
- of same ages, comparative structure, (50) 222.
- orientation, mechanism, (50) 225.
- penetrability for gases, (43) 732.
- photosynthesis and respiration, (41) 28.
- premature falling, cause, (48) 829.
- proteins from, (44) 504; (47) 109.
- respiration, carbohydrate-amino-acid relation in, (48) 825.
- respiration in vacuum or in scant oxygen, (50) 126.
- respiration rate, (46) 25.
- respiration, variation with age, (44) 824.
- senile, changes in, (43) 634.
- temperature, determining, (41) 222.
- transpiration, device paralleling, (41) U.S.D.A. 725.
- transpiring power, rôle of temperature in determination, (44) 131.

Lebbra, new sumac disease in Italy, (43) 49.

Lebistes reticulatus, one-sided masculine and sex-linked inheritance in, (48) 765.

Lecanium—

- corni, control, (44) Calif. 654.
- corni, notes, (42) 748.
- hesperidum, biology, (50) 255.
- n.spp., description, (43) Mich. 660.
- oleae, *see* Black scale.
- prunastri in Pennsylvania, (41) 164.
- viride, notes, (47) 53.

Lecithin—

- antigenic properties, (48) 280.
- determination in blood, (48) 110.
- feeding of white mice, effects, (41) 767, 768.
- of brain in avitaminosis, (50) 862.

Lecithin—Continued.

- relation to fishy flavor in butter, (42) N.Y.Cornell 564.

Leek moth, notes, (42) 152.

Leeks—

- effect of soil disinfection, (42) 717.
- fertilizer experiments, (42) 223.
- root development, (43) 834.
- variety tests, (41) 443.

Legume—

- bacteria as affected by sunlight and desiccation, (47) 216.
- bacteria in soil, movement, (48) 212.
- cover crops for coconuts, (49) Guam 427.
- cover crops, tests, (45) P.R. 631.
- diseases, (43) 652.
- diseases in Holland, (45) 842.
- forage, native, in Argentina, (45) 131.
- hay, feeding value, (46) Ill. 678.
- hays, digestibility, (47) Tex. 472.
- inoculants, tests, (48) N.J. 338.
- nitrogen v. commercial, (44) 22.
- seed as affected by chloropicrin, (45) 537.
- seed treatment, (45) 28.
- seeds, nutritive properties, (46) 161.

Legumes—

- and grasses, tests, (44) 434.
- arborescent, of Hawaii, (41) 344.
- as affected by potash, (49) 817.
- as affected by sulphur, (50) Oreg. 724.
- as green manure, (45) V.I. 127, 329; (48) U.S.D.A. 224; (49) Calif. 19.
- as silage crop, (49) 166.
- as source of nitrogen, (42) 20; (44) S.Dak. 511.
- breeding data, recording, (44) 521.
- breeding experiments, (44) 526, 632; (47) Miss. 227.
- chemical study, (50) Oreg. 7.
- culture, (43) Idaho 738; (45) Mo. 24.
- culture and harvesting, (48) Guam 228.
- culture experiments, (44) 433, 526, 632, Oreg. 826; (45) Kans. 33, Guam 34, Ariz. 429, 532; (47) Minn. 130; (48) 434, Ariz. 434; (49) Tex. 429; (50) S.C. 637.
- culture, handbook, (45) 128.
- culture in Cyprus, (44) 137.
- culture in Malaya, (48) 732.
- diseases, (42) 242.
- effect of cold on, (43) 432.
- effect on—
 - corn yield, (47) Ark. 733.
 - grain, (48) N.J. 324.
 - organic matter in soil, (49) N.Y. Cornell 117.
 - succeeding turnip crop, (41) 231.
- fertilizer experiments, (44) 632; (45) Miss. 126.
- fertilizing value, (47) 25; (48) 21.
- flagellation of nodule organisms, (43) 433.
- for silage, (41) Mo. 334.
- grafting experiments, (48) 127.

Legumes—Continued.

- in drills with corn, tests, (46) R.I. 226.
- inoculants, inspection, (47) N.J. 436.
- inoculants, laws concerning sale, (47) N.J. 234.
- inoculants, tests, (49) N.J. 636.
- inoculated, as nitrogenous fertilizers, (46) 518.
- inoculation, (41) Ga. 130, Mo. 335, 523, 832; (42) Mich. 694; (43) Mont. 321, Wyo. 436; (47) Mich. 196, 227, Wash.Col. 517; (48) Wash.Col. 832; (49) Mich. 97.
- inoculation—
 - commercial cultures for, (49) Iowa 723.
 - efficiency for Arizona soils, (49) Ariz. 620.
 - methods, (46) 830.
 - with nitragin, (43) 217.
- insects affecting, (43) 652; (50) 51.
- manganese and iron determinations, (49) Ky. 520.
- manganese content, (45) 803.
- manganese requirement, (49) 731.
- mealybugs attacking nodules, (49) 655.
- need for, (44) Mich. 195.
- nitrogen content as affected by fertilizers, (46) 120.
- nitrogen fixation by, (46) 514.
- nitrogen fixing capacity, factors affecting, (49) Wis. 620.
- nitrogenous fertilizers for, (47) 816.
- nodule bacteria of, morphology and physiology, (44) 730.
- pasture, pollination and fertilization. (48) 831.
- perennial, wintering, (50) 333.
- plant sap and calcium absorption, (50) 524.
- planted with corn, (47) R.I. 736.
- Pods, feeding value, (42) 769.
- production in Spain, (45) 696; (46) 696; (49) 193; (50) 795.
- relation to soil fertility, (49) Ala. 725.
- rotation experiments. (44) Oreg. 826.
- seed identification, (44) 143.
- substitutes in Germany, (43) 204.
- tests, (49) Oreg. 525.
- use as grasshopper bait, (43) 353.
- uses and feeding value, (48) Guam 228.
- utilization of nutrients by, (48) Calif. 523.
- value for nitrogen supply, (44) Mich. 815.
- value on Indiana soils, (41) Ind. 19.
- varieties, characteristics, (50) 237.
- varieties for hay and pasture, (41) 334.
- variety tests, (44) Mont. 331, 526, 632, Calif. 731, Oreg. 826; (45) Ariz. 429, 734, 735, Can. 822; (47) Minn. 130, Nebr. 736; (48) Can. 227, Minn. 331, Ariz. 434; (49) 31, 232, Idaho 732.

Leguminosae—

- flagellation of the nodule organisms, (42) 434.
- important for food and fodder, (41) 729.
- new genus, (44) 820.
- root nodules of, comparative studies, (43) 30.

Leguminous—

- field crops, insects affecting, (50) 153.
- plants of Hawaii, (44) 327.
- Leidyopsis sphaerica* n.g. and n.sp., studies, (41) 464.
- Leiomyza* in North America, (41) 62.
- Leioleurella*, new genus, erection, (48) 856.
- Leishman-Donovan parasite, development, (47) 182.
- Leishmania in fleas, (45) 558.
- Leishmania infantum*, studies, (41) 781.
- Lema bilineata*, biology and control, (45) 558.
- Lemas trilineata*, notes, (41) Conn.State 159.
- Lema trilineata*, parasitism of, (50) 849.
- Lemna* plants, growth in mineral solutions, (45) 220.

Lemon—

- black pit, notes, (49) Calif. 651.
- brown rot, notes, (43) 243; (44) 49; (47) Calif. 649; (48) 50.
- curing rooms, humidifier for, (42) 641.
- diseases, (47) 44.
- extract, analyses, (47) Me. 764; (50) Conn.State 160.
- green pit, (42) Calif. 842.
- groves of Spain, diseases and pests, (49) 438.
- gummosis, notes, (47) Calif. 649; (49) 650.
- juice—
 - analysis, (42) 112.
 - antiscorbutic factor as affected by cod liver oil, (49) 58.
 - antiscorbutic value, (41) 860; (43) 667.
 - bactericidal power of, (42) 7.
 - decitrated, preservation, (49) 806.
 - desiccated, antiscorbutic value, (46) 359.
 - effect of reaction on oxidation of vitamin C, (49) 806.
 - in canned goods, effect on *Bacillus botulinus*, (42) Calif. 863.
 - minimum antiscorbutic dose, (45) 869.
 - preservation, (45) 167; (46) 475.
 - sterilized, antiscorbutic value, (46) 761; (49) 365.
 - tablets as prophylactic against scurvy, (44) 362.
 - v. orange juice, antiscorbutic value, (42) 463.
 - vitamins A and B in, (43) 765.

Lemon—Continued.

- leaves, analyses, (44) 544.
 - oil, index of adulteration, (41) 715.
 - orchards, frost protection, (43) U.S. D.A. 440.
 - pie filling, notes, (42) N.Dak. 363.
 - purple scale, in Uruguay, (44) 252.
 - shellbark, notes, (48) Calif. 543; (49) 847.
 - shoots, water deficit in, (47) Calif. 628.
 - sirup, preparation, (47) Calif. 614.
 - stem-end rot in California, (42) 151.
 - stocks for oranges, (41) 447.
 - trees, production of laterals by branches, effect of position, (48) 838.
 - weevil, Fiji, notes, (49) 56.
 - wither tip, notes, (43) 243.
- Lemons—
- acid and water content at different stages, (50) 752.
 - alkali injury to, Calif. (42) 640, 819.
 - antiscorbutic value, (42) 57.
 - as stock for oranges, (47) 339.
 - bud curl or pinch at grafting union, (41) 452.
 - bud variations, (43) U.S.D.A. 440.
 - California, composition, (46) U.S.D.A. 140.
 - Chinese, growth-inhibiting substance in, (42) 335.
 - culture, Guam (42) 37; (45) 43.
 - culture experiments, (48) Hawaii 338; Calif. 447.
 - culture in Belgian Kongo, (45) 347.
 - culture in South Africa, (41) 540.
 - fertilizer experiments, (48) Calif. 447.
 - freezing point, (50) 644.
 - fruiting habits, (41) 651.
 - fumigation schedule, (42) 250.
 - internal browning of, (42) 151.
 - internal decline, (42) Calif. 842; (47) Calif. 651; (48) Calif. 542; (50) 753.
 - manufacture of citric acid from, (45) 808.
 - production east of Mount Etna, (49) 835.
 - pruned v. unpruned, (43) 239.
 - pruning, (49) Calif. 641.
 - rootstocks for, (44) Calif. 737.
 - spraying experiments, (43) 157; (47) 651.
 - storage experiments, (48) 839.
 - studies in India, (46) 640.
 - tissue breakdown in, (47) 248.
 - value against grasshoppers, (45) 151.
 - vitamin A in, (50) 59.
 - yields, variability in, (42) Calif. 819.
- Lenticels, structure and behavior, (45) 628.

- Lentils—**
 early growth in alkali soil, (42) Utah 28.
 nickel and cobalt in, (49) 520.
 phytin content, (47) 366.
 vitamin B in, (47) 661.
- Lentinus lepeus**, notes, (44) 27; (47) U.S.D.A. 451; (48) 353.
- Lentodinium tigrinum—**
 cause of roof decay, (42) 249.
 notes, (44) 651.
- Lentizites—**
 cyclogramma, notes, (47) 547.
 sepiaria—
 as affected by zinc chlorid, (49) 447.
 control, (49) Oreg. 539.
 notes, (48) 147, 353.
 on hemlock, (41) 454.
 spore germination, (44) 28, 55.
 spore germination, effect of acidity, (49) 125.
 spp., studies, (47) U.S.D.A. 451.
 trabeum, cause of roof decay, (42) 249.
 trabeum, notes, (44) 651.
 vialis, studies, (44) 27.
- Leocarpus fragilis**, notes, (45) 144.
- Leperisinus—**
 californicus on ash trees, (50) 259.
 sp., notes, (44) 256.
- Lepidin**, isocyanin dyes from, (44) 504.
- Lepidin**, preparation, (44) 504.
- Lepidiota—**
 albohirtum, life history, (46) 159.
 albohirtum, notes, (44) 653.
 frenchi, notes, (48) 358.
 spp., notes, (41) 354; (45) 359.
- Lepidium—**
 draba, eradication, (49) 832.
 sativum, limit of germination, (42) 39.
 sativum roots, growth relation to temperature, (45) 526.
- Lepidoderma—**
 albohirtum, life history, (46) 159.
 albohirtum, notes, (48) 358.
 albohirtum, proposed name, (45) 761.
 spp., control, (45) 859.
- Lepidomyia decessum** on flax, (45) 551.
- Lepidoptera—**
 collections at light traps, (42) 650.
 economic, studies, (41) 552, 757.
 forest, new species, (43) 853.
 forest, treatise, (48) 53.
 glandular nature of corpora allata, (44) 59.
 injurious, in Ceylon, (45) 656.
 injurious to apples, (47) Pa. 161.
 key, (44) 451.
 life cycle, (45) 251.
 new species, in National Museum, (46) 157.
 nocturnal, flight, (45) 852.
 on tobacco in Porto Rico, (49) 52.
 Rhopalocera, Trinidad, catalogue, (50) 455.
- Lepidopterous larvae—**
 food plants, (44) 348.
 of South Africa, food plants, (46) 247.
 olfactory sense of, (42) 155.
 preservation, (41) 56.
- Lepidosaphes—**
 becki, *see* Purple scale.
 ulmi, *see* Oyster-shell scale
- Lepiota** sp., notes, (47) 50.
- Lepisma** spp., habits and control, (46) Mich. 558.
- Leprosy**, chaulmoogra oil for, (46) 579; (47) 608.
- Leptinotarsa decemlineata**, *see* Potato beetle, Colorado.
- Leptobyrsa rhododendri**, notes, (48) 154; (49) 153.
- Leptocoris—**
 acuta, life history and control, (46) 458.
 varicornis, control, (42) 53; (50) 455.
 varicornis, notes, Guam, (42) 53; (45) 55; (46) 748.
 varicornis on rice, (42) 451.
 varicornis, summary, (43) 556.
- Leptoglossus—**
 gonogara, control, (49) V.I. 353.
 spp., notes, (48) 650.
- Leptohylemyia coarcata**, life history, (45) 557.
- Leptomonas (Herpetomonas) ctenocephali**, studies, (41) 781.
- Leptonecrosis** and leaf roll, relation, (46) 649.
- Leptops hopei**, notes, (42) 855; (48) 555.
- Leptops rhizophagus**, notes, (47) 761.
- Leptosphaerella platensis** n.sp., description, (49) 445.
- Leptosphaeria—**
 coniothyrium, notes, (44) Kans. 242; (46) 143; (48) 351.
 coniothyrium on apples, (42) N.Y. State 349.
 herpotrichoides, behavior of ascospores, (43) 750.
 herpotrichoides, notes, (43) 750; (46) 44.
 herpotrichoides, studies, (41) 655.
 sacchari, notes, (42) 150; (45) 443; (46) 45, 647.
 spp., notes, (46) 647, 845.
 tritici, imperfect stage, studies, (42) 351.
 vagabunda, notes, (46) 242.
- Leptosira—**
 icterohaemorrhagiae, *see* Spirochaeta icterohaemorrhagiae.
 icteroides, studies, (41) 851.
- Leptothyrium—**
 macrothecium, synonymy, (48) 848.
 pomi, control, (44) 446.
- Leptotrombidium akamushi**, studies, (42) 451.
- Leptus—**
 akamushi, notes, (41) 753.
 autumnalis, notes, (43) 260.
 spp., notes, (46) 255.

Lerema accius, notes, (48) 459.
Leskilne synonymy, notes, (41) 62.
Lespedeza, see *Clover*, Japan.
Letis mycerina, notes, (49) 550.
Lettuce—
 action of copper on, (45) 29.
 aerial fertilization with carbon dioxide, (41) Vt. 833.
 analyses, (43) 63.
 anthracnose, notes, (43) 152.
 as affected by sunshine and shade, (41) 738.
 bacterial rosette disease, (47) Ohio 751.
 bacterial rot, studies, (48) Ariz. 449.
 barium phosphate for, (42) R.I. 527.
 bottom-rot disease, (50) 651.
 carbohydrates, availability, (42) 457.
 culture experiments, (41) Ariz. 339; (49) Alaska 435.
 culture in muck soil, (44) 719.
 decay, cause, (44) 643.
 digestibility in stomach, (42) 862.
 disease—
 greenhouse, (43) Ky. 845.
 new, (42) Ohio 845; (49) Tex. 442.
 resistant varieties, (43) Md. 144.
 control, (44) N.J. 341.
 downy mildew—
 a transit disease, (50) 748.
 control, Iowa, (45) 748; (46) 345.
 in California, (49) 346.
 drop, control, (48) 347; (49) 246; (50) Pa. 445, Mass. 651.
 drop, notes, (44) Mass. 445; (45) 47, Pa. 246.
 Egyptian, oil of, analyses, (42) 202.
 failure to head, cause, (43) 446; (48) 145.
 fat-soluble vitamin in, (42) 556.
 fertilizer experiments, (41) 627; (44) R.I. 21; (47) R.I. 725; (50) S.C. 642.
 following different crops, (44) R.I. 33.
 grading and marketing in South Carolina, (50) 593.
 greenhouse—
 Bremia on, (47) 351.
 culture experiments, (41) Ill. 147.
 fertilizer experiments, (49) R.I. 533.
 improved strains, (47) 339.
 growth in artificial light, (48) 26.
 hardening process in, (46) Mo. 827.
 hardness, varietal differences, (46) 838.
 head, culture, (48) Can. 38.
 head, growing, harvesting, and marketing, (49) Colo. 137.
 head, production, (46) Idaho 839; (47) West.Wash. 497.
 iodine content, (43) 204, 632.
 iron content, (49) 503.
 irrigation experiments, (46) Mich. 537.
 leaf spot, notes, (45) 47.

Lettuce—Continued.

liming experiments, (41) 428.
 meiotic phenomena in, (47) 126.
 mosaic disease, transmissible, (45) 145.
 nickel and cobalt in, (49) 520.
 notes, (49) R.I. 533.
 production, (49) Wyo. 337.
 proposed standard grades, (44) 894.
 Romaine, chlorosis, (44) Conn.State 150.
 root development, (43) 834.
 root rot and tipburn, (49) Ky. 543.
 rust, (46) 43.
 Sclerotinia rot, notes, (47) N.J. 149.
 seed germination, (50) Minn. 137.
 seed infection, studies, (48) 46.
 tissue breakdown in, (47) 248.
 varieties, (48) S.C. 235.
 varieties at Wisley, (44) 40.
 variety tests, (42) Minn. 835; (43) Tex. 36; (46) Ohio 336, Guam 734; (49) Guam 435.
 vitamin B in, (47) 267.
Leucaena glauca, feeding value, (49) Guam 464.
Leucaspi indica, notes, (47) U.S.D.A. 359.
Leucite—
 as source of potash, (48) 324; (49) 817; (50) 324.
 fertilizing experiments, (46) 626.
 solubility, (46) 627.
Leucobrephe brephoides, habits, (44) 753.
Leucocyte—
 changes in pellagra v. beriberi, (45) 66.
 extract, effect on velocity of bacteriolysis, (41) 187.
Leucocytes—
 effect of vitamin deficiency, (49) 280.
 in blood of cattle, (47) 486.
 of immunized animals, specific substances in, (41) 186; (42) 474.
Leucopis bella, notes, (47) U.S.D.A. 159.
Leucoptera coffeella, see *Coffee leaf miner*.
 Leucosis of fowls, (49) 81.
 Leucospidinae, new species, description, (48) 360.
Leucospis slossonae n.sp., description, (48) 360.
Leucotermes—see also *Termes*.
 flaviceps, notes, (42) 851.
 lucifugus, chloropicrin for, (46) 656.
Leukemia—
 infectious, of chickens, (47) 885.
 problems, (49) 81.
 transmissible, new strain in fowls, (45) 386.
 Levan, formation in sugar, (44) La. 116.
 Levee embankments, tables of cubic contents, (41) 582.
 Level, homemade, description, (50) Wash. Col. 687.
 Leveling rod for floor grades, specifications, (42) 489.
Levuana iridescens in Fiji, (46) 247.
 Levulinic acid in foods, detection, (46) 416.

Levulose—

- and dextrose, ratio of utilization by plants, (43) 730.
 - content of straw, (47) 506.
 - determination, (41) 12.
 - determination, table for, (46) 506.
 - sirup from artichokes, (44) 313.
 - solution, effect on bud growth of cuttings, (49) 834.
 - use by plants, (42) 728.
 - usefulness in insulin cure, (50) 864.
- Lewis, C. I., biographical sketch, (50) 397.
- Libato, culture directions, (45) 35.

Lice—

- and nits, destruction, (43) 453.
 - bibliography, (43) 51.
 - biology, (41) 552.
 - biometrics of, (44) 853.
 - body, olfactory sense, (42) 152.
 - book, control, (43) U.S.D.A. 53.
 - control, (43) 852; (47) 53.
 - destruction by dry cleaning, (41) 255.
 - determination of sex, (43) 160.
 - in clothing, destruction by steam disinfectors, (42) 750.
 - infection with *Rickettsia prowazeki*, (48) 150.
 - investigations, (41) 457, 458.
 - on cattle, preventive for, (50) Mont. 182.
 - on chickens, remedies, (41) 662.
 - on pigeons, eradication, (47) U.S.D.A. 255.
 - plant, family name, (45) 757.
 - reaction to bites of, (41) 551.
 - rectal feeding, technique, (48) 53.
 - relation to cleanliness, U.S.D.A. (42) 180; (44) 281.
 - relation to trench fever, (41) 851.
 - relation to typhus, (41) 552.
 - South African, (42) 155.
 - spermatogenesis, (43) 256.
 - sucking, monograph, (43) 452; (46) 246; (50) 558.
 - sucking, of sheep, (47) Calif. 655.
 - treatise, (41) 457.
 - typhus virus in, infectivity, (48) 253.
- Lichens in orchards, control, (44) Oreg. 840.
- Lick-troughs for sheep, description, (42) 187.

Life—

duration—

- in *Drosophila*, (47) 864; (49) 568; (50) 824.
- in *Drosophila*, effect of density of population, (48) 471.
- in *Drosophila*, effect of etherization, (48) 166.
- in *Drosophila*, inheritance, (49) 667.
- in white mice, (41) 767.
- index of constitutional fitness, (50) 872.

standard, in diversified farming section, (50) N.Y.Cornell 294.

Life—Continued.

- zones and mammalian distribution, (48) 549.
 - zones of Canada, correction, (46) 655.
- Ligamentum nuchae, calcification, (47) 80.
- Light—*see also* Sunlight.
- action on colloidal chlorophyll, (46) 825.
 - artificial, effect on egg production, (41) N.J. 572, N.J. 869, Wash. 871; (44) Mont. 368; (45) 71; (46) N.J. 574, 678, Ky. 875; (47) N.Mex. 475, N.C. 577; (48) Mich. 373, N.J. 373, Calif. 667; (49) Can. 71, Mont. 171, Okla. 470, Ind. 573, Ky. 574.
 - artificial, effect on plants, (41) 885; (48) 26, 827; (50) Minn. 126.
 - colored, effect on—
 - Azotobacter agile*, (49) 18.
 - nitrogen fixation, (47) 31.
 - photosynthesis, (44) 518.
 - plant growth, (46) 325.
 - effect on—
 - action of stomata, (43) 131.
 - calcium in serum of rachitic children, (50) 466.
 - estimating uric acid in blood, (49) 113.
 - fruit bud formation, (43) N.H. 36.
 - germination, (42) 730.
 - growth, (50) 362.
 - growth in coleoptiles, (42) 129.
 - leaf injury from spraying, (44) 246.
 - plant absorption, (42) 729.
 - plant growth, (42) 128, 333; (43) 431; (45) 526; (46) 224.
 - submerged cranberry bog, (43) 836.
 - exposure and plant lice, (50) 845.
 - illumination on different surfaces, (48) U.S.D.A. 714.
 - measurements on heights and in forests, (41) 330.
 - monochromatic, orienting effects, (44) 520.
 - period, daily, effect on plant development, (49) 326.
 - prevention of rickets by, (49) Wis. 664.
 - producing organisms and luminescence, (45) 550.
 - rays, different kinds, prevention and cure of rickets by, (48) 365.
 - rays, supplementary value to vitamin A graded diet, (50) 667.
 - relation to growth of chickens, (50) 780.
 - relation to ophthalmia and growth, (50) 364.
 - relation to seed germination, (48) 626.
 - requirements of forest trees, (50) Vt. 343.
 - sources in plants, (42) 630.
 - trap for insects, (49) 51.

Light—Continued.

- wave lengths, effect on plants, (44) 824.
- waves in relation to protective action in rickets, (49) 65, 365.
- waves of different lengths, action on chlorophyll, (45) 31.

Lighting systems for farms, (50) 589.

Lightning—

- and forest fires, (44) U.S.D.A. 121.
- and trees, (48) 614.
- firing of wheat by, (44) U.S.D.A. 121.
- injury in potato field, (44) U.S.D.A. 121.
- injury to plants, (45) N.C. 443.
- injury to potato and cabbage, (48) 543.
- injury to rubber trees, (47) 356.
- photographs, (44) U.S.D.A. 121.
- protection, (42) 489.
- rods, installation, (45) Mich. 893.

Lignin, determination, (41) 14.

Lignocellulose, gelatinization, (50) 509.

Lignoceric acids, method of determination, (49) 611.

Lignum-vitae—

- uses and importance, (46) 446.
- uses and source, (41) 244.

Ligyus—

- fossator, notes, (45) 558.
- rugiceps, *see* Sugar cane beetle.
- sp., notes, (45) V.I. 150.

Lilac diseases, (46) 44.

Lilacs, effect of chloropicrin, (45) 28.

Lilacs, forcing experiments, (47) 642.

Lilies—

- culture on Pacific Coast, (43) 746.
- Easter, growing in garden, (45) 347.
- Easter, production in northern climates, (45) U.S.D.A. 644.
- Madonna, propagation, (44) 238.
- sterility in, (49) 141.

Lily bacterial disease, (46) 244.

Lily mildew, notes, (42) 46.

Limacina tangaensis, notes, (47) 547.

Limax cineris as carrier of Davainea, (41) 881.

Limax maxima, notes, (50) 57.

Limberneck in poultry, (44) 378; (50) 482.

Limberneck-like disease in fowls, cause, (50) Ill. 383.

Lime—*see also* Liming.

- absorption by soils, (43) 27; (50) Mass. 621.
- action in lime-sulphur and lead-arsenate spray, (42) 748.
- agricultural, analyses, (41) 24; (43) N.J. 326, 520.
- agricultural, definitions and specifications, (45) 25.
- agricultural, purity of, (42) 523.
- agricultural, sources, (44) N.Y.State 516.
- air slaking, (50) 123.
- analyses, (42) R.I. 526, 818; (44) Me. 423, R.I. 423; (45) N.J. 217, Can. 815; (46) R.I. 221, 719; (47) N.J. 28, Me. 125; (48) Mass. 522; (49) N.J. 325.

Lime—Continued.

- and chalk on Essex soils, (46) 521.
- and chalk, relative effects, (50) 820.
- and clay, insecticidal value, (46) 51.
- and magnesia, relation between, studies, (42) 126.
- and phosphoric acid assimilation by plants, relation, (48) 426.
- and potash, analyses, (43) 521, 631.
- as an amendment, (49) 324.
- as cure for clubroot disease, (47) 542.
- as fire blight remedy, (46) 451.
- as prevention of borax injury, (46) 123.
- assimilation in animals, (45) 773.
- availability of calcium oxid in, (46) 114, 310.
- available in quicklime and hydrated lime, (46) 310.
- borax and soda, injurious effect, (46) 521.
- burning and grinding plants in New Zealand, (46) 220.
- burnt, analyses, (43) 521, 631.
- burnt, carbonation in soils, (42) 127.
- burnt, effect on organic matter in soil, (43) 729.
- burnt, effect on swamp soils, (46) 319.
- burnt, v. limestone, (43) Can. 727.
- by-product, analyses and value, (49) 22.
- by-product, fertilizing value, (42) 127.
- chlorinated, as water disinfectant, (41) 583.
- chlorinated, for sterilizing milk utensils, (46) 175.
- coarse-grained v. fine, (43) 325.
- colloidal chalk, importance to agriculture, (45) 522.
- composition, manufacture, and properties, (48) 589.
- copper dust v. sprays, (49) N.Y.State 49.
- cost on farm, (46) 220.
- deficiency due to soil acidity, (44) 430.
- degrees of fineness, studies, (45) 625.
- different forms, action, (49) 818; (50) 324.
- different forms, fertilizing value, (46) Md. 321.
- different forms, relative value, (44) Del. 420; (47) Pa. 423.
- effect on—
 - action of calcium arsenate, (49) 751.
 - activity of phosphoric acid, (45) 24.
 - aluminum salts, (47) Ind. 124.
 - availability of phosphates, (45) Wis. 217.
 - biological activities in acid soils, (49) Oreg. 514.
 - cabbage clubroot, (44) R.I. 32.
 - citric acid solubility of basic slag, (46) 23.
 - germination of seeds, (50) 325.
 - grapes, (47) 324.

Lime—Continued.

effect on—continued.

- green manure, (48) Del. 619; (49) Miss. 421.
- hardpan subsoil, (49) Okla. 420.
- hay, (47) Minn. 121.
- hydrangeas, (48) 140.
- inorganic compounds in soils, (47) 323.
- loss of organic matter from soil, (50) Pa. 422.
- lupine nodule-forming bacteria, (42) 233.
- nitrate production, (46) 515.
- nitrification, (45) Iowa 117.
- nitrogen content of soil, (46) 425.
- organic matter in soil, (49) N.Y.Cornell 117.
- oxidizing power of soil, (44) 19.
- plant and soil acidity, (47) 517.
- root systems in hardpan subsoils, (47) Okla. 815.
- seed germination, (44) Va. 721.
- "sick" soils, (50) 521.
- soil extracts, (43) Mich. 124.
- soil nitrogen, (44) Va. 723.
- soil potassium, (43) 127.
- soil reaction, (48) 216.
- sour soils, (49) R.I. 512.
- soy beans, N.J. (46) 534; (48) 337.
- sulphate loss from soil, (50) 522.
- tobacco root rot, (43) 447.
- wood distillation, (47) 208.
- end liquor, analyses, (44) 724.
- factor and lime-potash law, theory, (46) 425.
- factor in soil improvement, (43) 128; (45) Pa. 215.
- faulty, in Bordeaux mixture, (49) 145.
- fertilizing value, (45) Guam 23, Ohio 119; (47) 24, Md. 235; (48) Can. 323, Mo. 616, Pa. 819; (49) 815.
- for grassland, different forms, (46) 436; (48) 228.
- for sprays, storage experiments, (49) 145.
- forms, relative value, (45) Del. 622.
- function in soil, (49) 516.
- hydrated and limestone, comparison, (42) R.I. 625.
- in dairy products, (46) 680, 710.
- in eggshell, rôle in formation of chick skeleton, (42) 768.
- in soil, changes in, (48) Fla. 215.
- in soil, determination, (47) 18.
- in Thomas slag, solubility, (47) 623.
- in white lead, determination, (41) 314.
- industry, agricultural, future of, address, (43) 27.
- industry in Montserrat, (41) 891.
- inspection and analyses, (49) 124, 215.
- inspection in Pennsylvania, (43) 326, 520.
- magnesian and calcic, effects, (47) 624.

Lime—Continued.

- materials in soil, lime requirement and reaction, (45) 331.
- methods of applying, (44) 218.
- milk, fungicidal value, (47) 546.
- niter, *see* Calcium nitrate.
- nitrogen, *see* Calcium cyanamid.
- phosphatic slag as source, (47) Ohio 624.
- phosphoric acid system, compounds in, (49) 214.
- potash, fertilizing value, (41) 724.
- potash law, (47) 818.
- precipitated, paper on, (49) Ohio 298.
- process in sugar manufacture, (46) 616.
- production—
 - and prices in 1918, (43) 630.
 - and sale, (42) 19.
 - and use, bibliography, (45) 817.
 - by farmer, (43) U.S.D.A. 428.
 - in United States, (44) 130; (50) 727.
 - sale, and use in 1922, (50) 724.
- products, analyses, (47) Mass. 221.
- properties and uses, (44) 24.
- refuse, analyses, (43) 28.
- registered brands, (46) 24.
- relation to agriculture, (44) 129.
- relation to plant chlorosis, (44) 243.
- requirement of livestock, (49) Wis. 167.
- requirement of soils, *see* Soils, lime requirement.
- resources of New Brunswick, (43) 623.
- resources of United States, (45) 816; (49) 124.
- rôle in soil improvement, (43) 428.
- situation in Michigan, (47) Mich. 625.
- sources and use, (42) 525.
- sources and use in England, (46) 821.
- sources in Pennsylvania, (44) 20.
- sources in Prussia, (44) 815.
- spreader, new, (47) Mich. 891.
- Stassfurt-salt by-product, preparation, (41) 724.
- top-dressing experiment, (47) Pa. 422.
- toxicity to *Fomes lignosus*, (49) 518.
- unburnt, analyses, (43) 521, 631.
- use, (42) 525; (44) 24, 821; (47) 216.
- use for water purification, (47) 288.
- use in soil improvement, treatise, (42) 524.
- use in soil sterilization, (42) 431.
- use on meadows, (50) 434.
- use on Missouri soils, (43) Mo. 729.
- use on soils, (43) 519; (50) 123.
- use with various fertilizer treatments, (50) Pa. 439.
- uses, outline, (46) 821.
- v. chalk, effect on grain, (48) 323.
- v. chalk for barley and wheat, (46) 716.
- value in lime-sulphur mixtures, (43) 235.
- weed-control value, (41) 538.

Lime (fruit)—

- die-back, notes, (47) 514.
- juice, minimum antiscorbutic dose, (45) 869.
- scrub, control, (46) 448.
- tree borer of New South Wales, (41) 555.
- trees, mistletoe on, (47) 546.
- with-tip, notes, (42) 741; (44) 750; (45) 751.

Limekiln gas, fertilizing value, (42) 723.
 "Lime-loving," definition of term, (50) 628.

Lime-magnesia ratio—

- effect on plant growth, (45) 425.
- effect on soils, (47) Va. 624.
- of soils, (45) 625.
- relation to phosphoric acid fertilization, (48) 219.
- studies, effect of magnesium toxicity, (50) 625.

Lime-nicotin dust, cooperative experiments, (49) 152.

Limequat, Eustis, new hybrid, (46) 40.

Limequats, new citrus hybrid, (49) 41.

Limes (fruit)—

- antiscorbutic value, (41) 470, 861; (42) 57; (43) 263.
- budding experiments, (46) 40.
- culture, (42) 140; (44) V.I. 339; (45) Guam 43.
- culture and pests, (49) Hawaii 641.
- culture experiments, (48) 737.
- disease of seedlings, (45) 54.
- fertilizer experiments, (42) 42; (46) 40.
- Fomes parasite on, (41) 658.
- gummy exudation from, (47) 839.
- insects affecting, (43) 450.
- sweet, as stocks, (41) 447.
- yield data, (42) 42.

Limestone—

- action on acid soils, (41) Ill. 818.
- analyses, (43) Oreg. 129, Can. 727; (45) N.J. 217, Can. 815; (46) 719; (47) 27, Me. 125; (49) Me. 218.
- analysis methods, (44) 203.
- and phosphate, fertilizing value, (47) 727.
- asphalt mortar, tests, (41) 884.
- calcined phosphatic, fertilizing value, (48) 721.
- calcium and magnesium, response of crops to, (47) N.Y.State 516.
- carbon dioxid determination in, (44) 203.
- coarse, value, (47) Pa. 422.
- dealers, list, (41) Iowa 24.
- degree of fineness, importance, (47) Mass. 221.
- deposits in New South Wales, (42) 815.
- effect of fineness, (46) 23, 122.
- effect on—
 - acid soil, (44) 125.
 - alfalfa, (49) Mich. 431.
 - nitrate production, (43) Ill. 214; (46) Mo. 315.

Limestone—Continued.

- effect on—continued.
 - potatoes, (48) Can. 323.
 - soil reaction, (48) Ky. 116.
- experiments on silt loam, (42) Wis. 327.
- fertilizing value, (44) Ky. 511, Oreg. 719; (47) Mich. 143.
- ground—
 - analyses, (43) Pa. 520.
 - effect on availability of phosphates, (43) 27.
 - fertilizing value, (43) 325, Wis. 336.
 - for cotton and corn, (41) Ark. 130.
- high-magnesium and high-calcium for acid soils, (46) R.I. 220.
- in soils of Greece, (47) 121.
- inspection and analyses in Ohio, (49) 124.
- magnesian, analysis, (48) 609.
- magnesian and nonmagnesian, comparison, (46) 425; (50) 219.
- manganese content, (41) 521.
- methods of applying, (49) Ohio 323.
- of North Carolina, (46) 521.
- phosphate, of New Zealand, (41) 326.
- pulverized, as mineral feed supplement, (44) Ohio 175.
- resources of Pennsylvania, (43) Pa. 520.
- solubility, relation to physical property, (50) 218.
- spreaders, Iowa (46) 385; (47) 792.
- tests, (49) Mo. 24.
- tests of neutralizing action, Mo. (44) 819; (47) 27.
- use in Illinois, (42) 218.
- use with green manure, (42) 218.
- v. burnt lime, (43) Can. 727.
- v. glacial drift for peat soils, (43) 631.
- v. hydrated lime, (42) R.I. 625.
- v. oyster shells for poultry, (47) Md. 73.
- various forms, comparison, (41) 520.

Lime-sulphur—

- and Bordeaux mixture, comparison, (43) 346; (44) Wis. 241, 246; (49) 44, Iowa 746.
- and calcium caseinate, fungicidal value, (50) 346.
- concentrates, manufacture and storage, (48) U.S.D.A. 502.
- dry v. liquid, (44) Oreg. 840; (47) Mich. 449, 844; (48) 50, Mo. 635; (50) 346.
- dry-mix, as substitute for self-boiled lime-sulphur, (49) N.J. 349.
- effect on apple blotch, (45) 751.
- effect on arsenical compounds, (49) 751.
- effect on peach foliage, (43) Ga. 146.
- form for scab control, Mich. (44) 544; (46) 443.
- fungicides and insecticides, (49) 145.

Lime-sulphur—Continued.

- injury to peach foliage, (44) Calif. 743.
 lead arsenate spray, (44) Oreg. 832.
 liquid, insecticidal value, (46) N.J. 556.
 mixtures—
 action of lime in, (43) 235.
 analyses, N.J. (43) 37; (44) 440.
 composition, (43) 544.
 dilution, (41) Ill. 146.
 dusting experiments, (42) 541.
 fungicidal value, (41) 657, 658; (42) 541; (43) Ind. 345; (47) 152.
 homemade, directions, (42) S.C. 341.
 insecticidal value, (43) 255; (44) Pa. 757, Mo. 856.
 lime in, (42) 748.
 naphthalene, (41) 657.
 preparation, (41) 842; (43) Pa. 539, Ky. 834.
 studies, (48) 155.
 use, (41) Mo. 356.
 use in winter, (43) 346.
 use with lead arsenate, (41)⁶ Ill. 750.
 value of saponin in, (43) 346.
 plants, construction, (48) U.S.D.A. 591.
 products, sulphur compounds in, (50) 107.
 spray following Bordeaux, tests, (45) 451.
 sprays, preparation and properties, (45) 541.
 toxicity, (47) N.H. 243.
 use against San José scale, (49) 452.
 Limewater and casein, fixatives for Bordeaux mixture, (47) 51.
 Limicola platyrhyncha, proper name, (41) 250.

Liming—see also Lime.

- benefits to sandy soils, (42) Wis. 323.
 effect on—
 adsorptive power of soils, (45) 25.
 alfalfa and clover, (48) Wis. 213.
 availability of soil potassium, phosphorus, and sulphur, (46) 24.
 carbon dioxid fertilization, (45) 624.
 composition of soil, (47) 518.
 loss of plant nutrients by leaching, (48) 220.
 manure nitrogen, (42) 524.
 moor soils, (44) 813.
 nitrogen loss, (42) 124.
 peat bogs, (43) 325.
 phosphatic fertilizers, (50) 19.
 potash solubility, (41) 126.
 salts in alkali soils, (42) 626.
 soil acidity, (43) 212.
 soil drainage water, (47) 323.
 soil potash and phosphoric acid, (42) 524.

Liming—Continued.

- effect on—continued.
 solubility of soil phosphates, (43) 629.
 experiments, (41) Mass. 21, N.Dak. 124, R.I. 135, Del. 136, Del. 137, 228, 428, 520, Mo. 624; (43) Okla. 32, Md. 122, Can. 727, Can. 729; (44) 320; (45) 217, 340, 624, Mich. 624, Can. 817; (46) Oreg. 215, 427, 625; (47) Mich. 124, Ohio 818; (49) Guam 414, 516, 624, Ohio 724.
 experiments—see also *special crops*.
 in Denmark, (42) 523.
 in England, (42) 126.
 in Georgia, (48) 823.
 in New Zealand, (48) 822.
 in Queensland, (42) 524.
 in Rhodesia, (46) 817.
 on acid muck soils, (48) Mich. 325.
 on bog soils, (41) 230.
 on grassland, (41) 826.
 on moor soils, (41) 212, 520.
 on soils of Wales, (46) 122.
 for plowed-out grassland, (44) 422.
 importance in soil management, (49) 818.
 Kansas soils, (47) 324.
 magnesian v. calcic limes, (45) R.I. 817.
 need on German soils, (42) 516.
 need on Texas soils, (42) Tex. 121.
 of Essex soils, (41) 724.
 of French soils, (42) 723.
 of humus soils, importance, (46) 621.
 of Iowa soils, (41) Iowa 24.
 of Michigan soils, (42) Mich. 330.
 of soils injurious to plants, (48) 220.
 relation to acidity of moor soils, (42) 431.
 with crop rotations, (46) 426.
 Limmerium disparis, parasitism by, (46) 457.
 Limonanges, citrus hybrids, (44) 44.
 Limonite, effect on oxidation of sulphur, (45) 332.
 Limphysothrips, new genus, erection, (42) 648.
 Linalyl esters in peaches, odorous constituents, (48) 608.
 Linden—
 lace bug, notes, (41) 847.
 leaves and twigs, feeding value, (45) 774.
 seed cake, feeding value, (42) 369.
 Lindens, parasitic infection of, (42) 51.
 Linear bug on sugar cane, (46) 246.
 Linen—
 industry, treatise, (48) 438.
 manufacture and properties, (44) 393, 635.
 Linkage—
 and chiasmatype, (43) 269.
 complete, in Drosophila, (48) 166.

Linkage—Continued.

- in Begonia, (43) 632.
- in cattle, (43) 375.
- in corn, (41) 436; (48) 228, 630; (49) N.Y.Cornell 32.
- in cotton, (50) 633.
- in Drosophila, studies, (44) 174.
- in egg production, (42) 872.
- in grouse locust, (42) 768; (44) 470.
- in mice, (43) 669; (46) 268.
- in mice and rats, (42) 762; (44) 67.
- in pigeons, (42) 764.
- in poultry, (46) 769.
- in rabbits, (44) 67.
- in rats and mice, (42) 762; (44) 67.
- in silkworm, (48) 764.
- relations of sex-linked characters in Drosophila, (48) 764.
- strength, use of term, (43) 268.
- studies, (43) 268, 269.
- values, genetic variation in, (50) 129.
- values, probable errors, (43) 268.
- with lethal factors in Oenothera problem, (49) 567.

Linospira trichostigmae n.sp., description, (45) 338.

Linseed—

- cake, analysis, (41) N.H. 68, Ind. 868; (42) 769, N.H. 769; (44) Mich. 568, N.H. 671; (45) 872; (46) Can. 168, Mich. 168; (48) 68.
- hulls, detection in feeds, (50) 468.

meal—

- analyses, (41) N.H. 68, Conn. State 176, R.I. 564, Can. 565, 868, Ind. 868, N.Y.State 868; (42) Mich. 63, 263, 560, Ind. 769, N.H. 769, Tex. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, Vt. 464, N.J. 672, 867, Ind. 867; (44) Mich. 568, Mass. 671, N.H. 671, Pa. 769; (45) N.Y.State 469, N.J. 775, 872, R.I. 872, Vt. 872; (46) Mich. 168, N.H. 675, Tex. 675; (47) N.Y.State 172, Mass. 274, 275, Ind. 473, N.J. 570, R.I. 571; (48) 68, Me. 68, Can. 368.
- and screenings, analyses, (41) Ind. 564.
- and screenings oil feed, analyses, (43) Ind. 867; (45) N.Y.State 469, 872; (46) Mich. 168.
- as corn supplement, (42) Kans. 375; (43) Ohio 377.
- as milk substitute for calves, (44) 776.
- as protein supplement for pigs, (49) Mich. 469.
- chlorin determination, (42) 506.
- composition and retail prices, Conn.State (44) 176; (45) 375; (47) 570.
- energy value, (47) 69.

Linseed—Continued.

meal—continued.

- feeding value, (41) Kans. 69, Ind. 70, Mich. 74, 569, Nebr. 770, 771; (42) Kans. 372, Ohio 871; (44) Del. 367, Pa. 770; (46) Ind. 477; (47) 76, Iowa 479; (48) Wash.Col. 71, Mo. 666, 777.
- for horses, (41) Mass. 274.
- long-continued feeding, effect, (47) Okla. 868.
- protein, utilization by dairy cows, (43) S.Dak. 873.
- v. cottonseed meal, (47) Wyo. 572.
- natural crosses of, (44) 429.
- oil—
 - adulterated with bean oil, detection, (44) 805.
 - analysis, (45) 806.
 - and cake, manufacture, (44) 635.
 - hardened, arsenic and nickel content, (42) 610.
 - hydrogenated, food value, (45) 367.
 - industry, (42) 392.
 - manufacture and sale, laws regulating, (48) 784.
 - phytosterols in, (50) N.Y.State 408.
 - production in Great Britain, (41) 734.
 - use with Bordeaux, (41) 355.
 - vitamin A in, (50) 163.
- Lint frequency in cotton, (43) Ark. 530.
- Linters, production, marketing and uses, (45) U.S.D.A. 233.
- Liodontomerus* spp., notes, (43) U.S.D.A. 365.
- Liparis dispar*, see Gipsy moth.
- Liparis monacha*, see *Lymantria monacha*.
- Lipase—
 - action on milk fat, (43) Mo. 712.
 - activity, effect of antiseptics, (47) 803.
 - castor bean, preparation, (47) 13.
 - in calf fetus, (44) 865.
 - in milk, detection, (47) 109.
 - in pollen, (48) 728.
- Lipases of castor and soy beans, (42) 707.
- Lipeurus variabilis*, notes, (44) 881.
- Lipochrome pigments of animal body, (45) 64.
- Lipochromes, association of vitamin A with, (44) 764; (49) 768.
- Lipoid—
 - content of plasma in plants, (44) 630.
 - fixation reaction—
 - description, (43) 685.
 - for dourine diagnosis, (45) 785.
 - for glanders diagnosis, (43) 277, 471.
 - new method for preparing, (43) 278.
 - fixation test, clinical applicability, (47) 485.

Lipoid—Continued.

- formations in plant cells, (50) 23.
- free diet, cholesterol in, (42) 258.
- gland, use of term, (44) 466.
- granulations in plant cells, (50) 125.
- granulations, use of term, (50) 23.
- metabolism and vitamins, (44) 466.
- phosphoric acid in blood, determination, (48) 110.

Lipoids—

- action in growth, (47) 820.
- as antigens, (41) 477.
- determination, (41) 116, 764.
- determination in blood, (45) 110.
- essential for life, (42) 257.
- importance in nutrition, (41) 559.
- in plant cells, demonstration, (43) 524.
- in the blood in Tropics, (41) 764.
- organ, origin of, (41) 673.
- retarding action, (42) 310.
- rôle in infection and immunity, (46) 276.
- rôle in resistance to tuberculosis, (42) 569.

Liponyssus—

- bacoti attacking man, (50) U.S.D.A. 159.
- bursa and Dermanyssus gallinae, comparison, (42) U.S.D.A. 656.
- bursa, life history and control, (42) U.S.D.A. 656.
- bursa, notes, (49) 381, 848.

Lipovaccines—

- and vaccines, immunity tests, (47) 879.
- method of sterilization, (43) 76.
- potency of, (45) 780.
- preparation, (41) 377; (47) 879.

Liquids—

- biological, determination of H-ion concentration, (49) N.Y.Cornell 712.
- carbon content, determination, (49) 803.
- distilling apparatus, (46) 414.
- extraction, apparatus, (44) 10.
- foaming, flask for distillation, (44) 10.
- movement in plants and evaporimeter, (47) 30.
- opacity, measuring, (46) 111.
- rate of ascent in granular media, (48) 18.
- sterile, mechanical measuring instrument for, (45) 11.

Liquors, analysis, official method, (44) 9.

Lissonota—

- n.sp., notes, (44) U.S.D.A. 163.
- n.spp., descriptions, (43) 857.

Lissorhoptrus simplex—

- notes, (44) La. 334.
- studies, (43) U.S.D.A. 252.

Lita solanella, control, (48) 554.

Litchi—

- culture, (44) Hawaii 44; (46) 235; (48) Hawaii 338.
- propagating method, (48) 639.

Literature and weather, (44) U.S.D.A. 416.

Lithium in Hagerstown soil, (49) Pa. 210, 617.

Lithium in plants, (46) Colo. 28.

Lithium injections for chestnut blight, (45) 549.

Lithocolletes fragilella, studies, (42) 251.

Lithosiadae, catalogue, (44) 550.

Litmus, bromthymol blue as substitute for, (47) 108.

Litmus paper test for soil reaction, (50) 619.

Litter size, influence of male on, (41) 268.

"Little leaf" of fruit trees, studies, (41) 452.

Liver—

- and kidney, relationships, (44) 374.
- atrophy in horses, (41) 873.
- autoxidizable constituent, (46) 110.
- changes in deficiency disease, (43) 664.
- cirrhosis, enzootic, (44) 76.
- effect on blood regeneration, (44) 565.
- fluke infection, complement fixation reaction in, (49) 77.
- manganese content, (43) 615.
- of rat, vitamin C content, (44) 862.
- oils, sulphuric acid reaction, (48) 758; (49) 410, 611.
- pig's, antirachitic properties, (50) 771.
- relation to blood protein, (41) 859.
- tryptophan content, (45) 312.
- vitamin A storage in, (49) 260.
- zinc content, (42) 758; (45) 64.

Livestock—see also Animals, Cattle, Sheep, etc.

- and farm mechanics, treatise, (48) 497.
- as affected by St. John's wort, (43) 380.

breeding—

- and feeding, treatise, (47) 865.
- in French colonies, (44) 267.
- in Great Britain, (42) 562.
- in Madagascar, (42) 669.
- in Morocco, (47) 173.
- principles, (44) U.S.D.A. 568.
- ratio of sires and dams, U.S.D.A., (43) 770; (45) 773.

breeds in eastern Kongo, (50) 868.

breeds in Italy, best, (49) 67.

buildings for, (42) 590.

cars, cleaning and disinfection, (42) 877.

census in Sao Paulo, (44) 491.

conditions in Europe, (43) U.S.D.A. 464.

cooperative marketing in Ohio, (50) 393.

cooperative shipment, (45) 873.

cottonseed products for, (44) U.S.D.A. 867.

distribution in South America, (46) 269.

drought relief work in 1919, (43) U.S. D.A. 464.

emergency feeding in Sweden, (43) 170.

equipment for Wyoming, (49) 890.

experiments, uniform methods, (47) 76.

Livestock—Continued.

- exports from Great Britain, statistics, (42) 562.
- farming, effect of capital on, (44) Mo. 788.
- farming in Missouri, (45) U.S.D.A. 86.
- farming, profits, (43) Ohio 322.
- farming, treatise, (42) 263.
- feeding, (50) U.S.D.A. 774.
- feeding—
 - and breeding, treatise, (44) 864.
 - and improvement, (43) 68.
 - and vitamin hypothesis, (48) 368.
 - lessons in, (42) 693.
 - principles, (47) 70.
 - relation to health, (47) 283.
 - standards, (42) 669.
 - treatise, (44) 266.
- freight rates, (46) 894.
- French, improvement, (47) 571.
- grades of Bureau of Markets, (45) 89.
- grazing, factor in forest fire protection, (44) U.S.D.A. 239.
- grazing rate in relation to rainfall, (43) U.S.D.A. 717.
- handling, (45) 680.
- improvement, (43) U.S.D.A. 464, U.S. D.A. 473; (45) 375, U.S.D.A. 773.
- improvement in Porto Rico, (47) 173.
- improvement, plan of "crusade," (42) U.S.D.A. 866.
- improvement, relation of fairs to, (48) 398.
- in Canada in 1917, (41) Can. 594.
- in Netherlands, (49) 94.
- in southeastern Ohio, (49) Ohio 298.
- increase in value, division between landlord and tenant, (49) 892.
- industries in China, (46) 573.
- industry—
 - American, treatise, (50) 167.
 - as affected by prices, (44) 690.
 - changes in, (42) 878.
 - credit conditions, (47) 295.
 - importance of, in United States, (42) U.S.D.A. 168.
 - in Algeria, (49) 895.
 - in Argentina, founders, (50) 573.
 - in Belgium, development, (47) 492.
 - in Belgium, government aid, (46) 292.
 - in Dutch East Indies, (41) 768.
 - in Ecuador, (47) 596.
 - in France, (42) 287.
 - in Japanese Sakhalin, (42) 393.
 - in North Africa, treatise, (42) 560.
 - in South America, (48) U.S.D.A. 266.
 - relation to chemistry, (50) 608.
 - relation to diseases, (44) 180.
 - world's, and British needs, (49) U.S.D.A. 892.
- injury from wire grass, (49) 679.
- insect enemies in Colorado, (44) 180.
- insects affecting, (46) 558; (47) 848; (50) 453.

Livestock—Continued.

- inspection in Canada, (42) 379.
- insurance, (41) 793.
- insurance in Germany, (44) 593.
- international trade, (46) 675.
- judging, (44) 494.
- judging as factor in education, (47) 696.
- judging contests, (48) N.Dak. 97.
- judging, treatise, (43) 494, 697.
- laws of Maryland, (41) 81.
- laws of Nevada, (44) 671.
- loss of weight during transportation, (43) 672.
- loss through simulids, (43) 51.
- management in connection with teaching of rural science in elementary schools, (49) 394.
- management, summer, (45) Mich. 698.
- market, American, (48) 390.
- market reports, (41) U.S.D.A. 672.
- market review, (42) 492.
- marketing, cooperative, (41) 593; (42) 291.
- marketing, cooperative, in Canada, (42) 263.
- marketing, cooperative, in Missouri, (46) 390.
- markets, government supervision, (43) U.S.D.A. 464; (48) 398.
- mineral requirements, (49) Wis. 167.
- needs in Brazil, (42) 370.
- of Dutch East Indies, statistics, (44) 569.
- of Great Britain, treatise, (50) 670.
- on sugar plantations, (48) 369.
- parasites, summary, (47) 283.
- parasitic diseases, relation to insects, (43) 883.
- patent medicines for, (41) N.Dak. 673.
- poisoning, (43) Nev. 273; (45) Ariz. 478, Wyo. 479; (47) 283.
- poisoning—*see also* Cattle and Forage poisoning, Plants, poisonous, and specific plants.
 - and first aid, (49) 177.
 - by Baccharis cordifolia, (45) 781, 782.
 - by Bikukulla, (48) 674.
 - by cocklebur, (50) U.S.D.A. 77.
 - by death camas, (45) Nev. 782; (47) U.S.D.A. 181, U.S.D.A. 878.
 - by greasewood, (50) U.S.D.A. 77.
 - by infected Paspalum, (45) 783.
 - by Mexican whorled milkweed, (46) U.S.D.A. 280.
 - by milkweed, (44) Nev. 874.
 - by sneezeweed, (46) U.S.D.A. 82.
 - by sorrel, (45) 583.
 - by St. John's wort, (44) 275.
 - by water hemlock, (45) Nev. 782.
 - by white snakeroot, (50) Ind. 181.
 - by whorled milkweed, (43) Colo. 141, U.S.D.A. 470, U.S.D.A. 471.
 - from mine refuse, (44) 223.

Livestock—Continued.

- predatory enemies, control, (45) U.S. D.A. 754.
- present and potential production in French colonies, (49) 389.
- prices, cyclic changes, (44) N.J. 364.
- prices, fall, in Czechoslovakia, (49) 92.
- prices, relation to carcass perishability, (47) 278.
- production—
 - climatic conditions controlling, (41) U.S.D.A. 417.
 - in Catalonia, (47) 866.
 - in East Africa, (44) 594.
 - in French Alps, (49) 390.
 - intensive, (44) 569.
 - relation of insects to, (44) 162.
- purebred—
 - associations in Canada, records, (49) 267.
 - exporting to South America, (43) U.S.D.A. 464.
 - list of breeders, (43) Mont. 171.
 - 1920 census, (44) 866.
 - of United States, (42) U.S.D.A. 168.
 - Scottish, history, (43) 171; (45) 375.
 - utility value, (48) U.S.D.A. 266.
- range, extension program in, (50) U.S.D.A. 695.
- Registry Board, report, Kans. (43) 674; (50) 71.
- relation to size of farm, (44) 568.
- relation to soil fertility, (42) 19.
- remedies for, (42) Wyo. 174.
- remedies, inspection, (41) Conn.State 176.
- remedy law, enforcement, (50) Kans. 77.
- resources of Morocco, (44) 267.
- runs, cause, (45) U.S.D.A. 773.
- sales pavilions, construction, (45) Iowa 84.
- sanitary laws of Montana, (42) 474; (46) 81.
- sanitation in transportation, (42) 878.
- sanitation, popular articles, (50) 180.
- shipping associations—
 - accounting records, (48) Iowa 790.
 - accounting records and business methods, (50) U.S.D.A. 92.
 - accounts system, (45) 293.
 - cooperative, (44) Wis. 91; (46) 595; (48) U.S.D.A. 688; (49) Mo. 293.
 - organization and management, (49) Minn. 488.
- shipping, cooperative, in Iowa, (46) Iowa 90.
- situation, (47) Mich. 697.
- situation in 1919, (41) U.S.D.A. 891.
- skin affections, (48) 81.
- slaughtering, (49) 570.

Livestock—Continued.

- State requirements for admission, (43) U.S.D.A. 272.
- statistics, (47) U.S.D.A. 94, 298; (48) U.S.D.A. 289, U.S.D.A. 295, 894; (49) U.S.D.A. 391.
- statistics of—
 - Arizona, (49) 392.
 - Australia, (43) 171.
 - Brazil, (49) 392.
 - Canada, (45) 295; (46) 293; (49) 491.
 - Chicago, (42) 867.
 - Connecticut, (49) 392.
 - Finland, (47) 395.
 - France, (41) 671.
 - Great Britain, (44) 492.
 - India, (42) 170.
 - New Zealand, (42) 90.
 - South Australia, (45) 173.
 - United Kingdom and France, (41) U.S.D.A. 671.
 - United States, (47) 95.
- textbook, (43) 770.
- tonics, value as anthelmintics, (44) 185.
- treatise, (48) 693.
- types and market classes, (43) 697.
- watering tanks, construction, (47) 392.
- Living, cost of, *see* Cost of living.
- Lixivator, description, (46) 23.
- Lizards, control of insects by, (44) 651.
- Lizards, food habits, (49) 151.
- Lizoniella platensis n.sp., description, (49) 445.
- Llama, domestication in Peru, (41) 869.
- Loco weed—
 - disease, (41) U.S.D.A. 582.
 - eradication, (42) 379; (44) Ariz. 581; (46) Mont. 334; (49) Mont. 178.
 - poisonous to livestock, (42) 879; (45) Ariz. 479, Wyo. 479.
 - problem, discussion, (45) 881.
 - white, identification, (42) 776.
- Locust bean meal in mixed feed, estimation, (50) Mich. 715.
- Locust, black—
 - culture, (43) Idaho 344.
 - effect on growth of catalpa, (47) Pa. 442.
 - use of bark as grasshopper bait, (43) 353.
 - wood-boring beetles attacking, (43) 854.
- Locust borer—
 - control, (41) U.S.D.A. 358.
 - relation to Solidago species, (46) Ky 57.
- Locust—
 - heart rot, notes, (41) 752.
 - leaves and twigs, feeding value, (45) 774.
 - poison, South African, (45) 756.
 - tree and its allies, geologic history, (41) 46.

- Locusta danica*, notes, (43) 52.
Locustana pardalina, life history, (50) 257.
 Locusts—
 brown, life history, (50) 257.
 control, (41) 455, 662; (45) 551; (46) 748; (49) 450.
 control, biological method, (47) 360.
 control in Canada, (45) 756.
 control in Uruguay, (46) 853.
 control, international conference, (46) 853.
 control work, organization, (45) 756.
 economic importance, (50) 257.
 effect on ranges, (47) 756.
 in Argentina, (45) 455.
 in France, (45) 454.
 in Greece, disease of, (48) 154.
 in Manitoba, (45) 454.
 in western Canada, (42) 851.
 invasion of British Guiana, (43) 159.
 lesser migratory, habits, (47) 360.
 life history, habits, and control, (50) Colo. 52.
 long-winged, of the plains, (50) 151.
 migratory, in Caucasus, (50) 255.
 migratory, summary, (47) 552.
 Moroccan, in Crau, (46) 657.
 notes, (43) 52; (50) 256.
 of New England, manual, (44) 58.
 outbreak in Manitoba, (47) 756.
 outbreaks and control, (46) 657.
 periodical, *see* Cicada, periodical.
 17-year, *see* Cicada, periodical.
 summary, (45) 456.
 Loeb, J., biographical sketch, (50) 599.
 Logan beetle, control, (46) 460; (50) 661.
 Loganberries—
 canned juice for jelly making, (47) Calif. 614.
 culture, Wash. (42) 536; (44) 43.
 culture, treatise, (42) 442.
 dried, antiscorbutic value, (47) 62.
 drying, Calif. (45) 808; (48) 507.
 insects affecting, (43) 155, 659.
 preserving, (45) 665.
 storage experiments, (44) Calif. 738.
 storage temperature, (47) Calif. 640.
 training and harvesting, (44) Wash. 237.
 Loganberry—
 anthrocnose, (43) Wash. 155.
 bud blight, notes, (49) Oreg. 546.
 crown borer, notes, (44) Oreg. 850.
 crown gall, notes, (46) 143; (49) 45.
 die-back, notes, (49) Oreg. 539; (50) 751.
 gall, (43) Wash. 155.
 juice, analyses, (41) U.S.D.A. 111.
 juice, manufacture, (43) Calif. 717.
 mosaic, notes, (49) Oreg. 755.
 orange rust, (43) Wash. 155.
 plantations, establishment and care, (49) Oreg. 742.
 sirup preparation, (48) Calif. 507.
 vines, cause of failure, (44) Calif. 744.
- Logging—
 costs in Ontario, analysis, (42) 239.
 operations, time studies, (48) Calif. 541.
 treatise, (50) 444.
 use of aircraft in, (44) 148.
 with belt tread tractors, (42) 785.
 Log-piles, fire hazard, (43) 651.
 Logs—
 cost of making from small and large timber, (47) Calif. 540.
 green, insect injury, prevention, (48) U.S.D.A. 52.
 making, time study, (44) Calif. 742.
 subcortical temperatures, (45) 852.
 Loin disease of cattle in Texas, (45) 886.
 Lolium—
 multiflorum, description, (42) U.S.D.A. 340.
 subulatum as pasture grass, (41) 641.
 Lonchaea aristella—
 enemy of fig in France, (46) 248.
 studies, (41) 552, 553.
 Lonchocarpus cyanescens, indigo from, (41) 734.
 Longan, culture, (46) 235.
 Longistigma caryae, honeydew production by, (50) 557.
 Longitarsus—
 nigripennis, life history, (45) 658.
 parvulus, life history and bionomics, (48) 459.
 parvulus, notes, (46) 743; (48) 152.
 Loom pickers from water-buffalo hides, (47) 670.
 Lophosphaeria tahitensis, notes, (47) 547.
 Lophodermium—
 macrosporum, notes, (42) 50.
 rhododendri, description, (45) 547.
 Lophyrus—
 pallipes, paper on, (50) 255.
 simile, *see* Diprion simile.
 Loquat—
 apple scab on, (43) 243.
 black spot fungus, notes, (44) 842.
 diseases, notes, (47) 839.
 Loranthaceae, sap concentration, (41) 632.
 Loranthus on mango, (46) 343.
 Loranthus, damage to trees by, (46) 245.
 Loroglossin, new glucosid, preparation and properties, (42) 728.
 Lotus—
 borer, biology, (47) U.S.D.A. 760.
 borer, notes, (44) 352.
 leaf spot, notes, (48) 549.
 Louisiana—
 Stations, notes, (41) 498, 899; (42) 600; (43) 398, 699; (44) 699; (45) 498, 900; (46) 395; (49) 99, 397; (50) 396, 697.
 Stations, report, (43) 698; (45) 297; (47) 496; (49) 898.
 University, notes, (41) 498; (43) 398; (45) 300, 498.

Louping-ill—

in sheep, effect of nutrition, (50) 266.
studies, (41) 578; (42) 677.

Louse—

body, as affected by toxic gases, (44)
U.S.D.A. 55.
egg, maturation, (43) 256.
spermatogenesis, (43) 256.
sucking, affecting cattle, (45) 853.

Loxostege sticticalis, *see* Beet webworm
and Sugar beet webworm.

Lubin, D., biography, (50) 89.

Lubin, D., memorial to, (44) 398, 900.

Lubricants—

effect of graphite, (46) 782.
measurement of oiliness, (47) 889;
(48) 887; (49) 387.
solid, summary of information, (49)
888.

Lubricating oils, motor, tests, (49) 384.

Lubrication—

and lubricants, (46) 781.
cylindrical journal, studies, (48) 886.
effective, requirements, (47) 592.
mechanism, (47) 890.
research on, (48) 886.
treatise, (44) 586.
viscosity and friction, (46) 688.

Lubricators, tests, (45) 186.

Lucern, *see* Alfalfa.

Lucilia—

caesar, Empusa disease in, (42) 361.
caesar larvae, anaerobes from, (47)
258.
sericata, notes, (49) 156.
spp., notes, (48) 254.
spp., relation to anthrax, (41) La. 461.

Lumbang oil—

analyses and solubility, (46) 109.
hydrogenation, (50) 309.
industry in Philippines, (42) 115.

Lumbar paralysis in goats, (48) 882.

Lumber—*see also* Timber and Wood.

affected by termites, (48) V.I. 354.
aircraft, preparation of, (43) 544.
airplane, production in British Colum-
bia, (42) 447.
and its uses, treatise, (43) 344.
and timber of Sweden, production and
exportation, (45) 540.
cut of United States, (49) U.S.D.A.
239.
export and our forests, (41) U.S.D.A.
448.
grading rules, (42) U.S.D.A. 643.
industry—

and allied trades of Czechoslo-
vakia, (50) 744.
and export trade of Finland, (46)
237.
and export trade of Sweden, (45)
141.
in the United States, history, (43)
44.
in United States, treatise, (50)
344.

Lumber—Continued.

kiln-drying, (45) 185; (49) U.S.D.A.
386.

kiln-drying, progress in, (50) 243.

manufacture and distribution, trea-
tise, (47) 540.

manufacture in Douglas fir region,
(48) 589.

market, French, (50) 243.

market in Italy, (43) 242.

markets of Spain and Portugal, (45)
142.

policy, national, (41) U.S.D.A. 149.

production in 1918, (43) U.S.D.A. 150.

properties and uses, treatise, (50) 838.
rôle in economic progress and interna-
tional trade, (49) 94.

seasoning, kiln for, (44) U.S.D.A. 286.
treatment with creosote, specifications,
(42) 489.

yard, specifications, (50) U.S.D.A. 187.

Lumbering in Douglas fir region, (43) 343.

Luminescence of *Pseudomonas luminescens*,
(41) 222.

Lumpy jaw, *see* Actinomycosis.

Lunar—

periodicity in living organisms, (49)
115.

periodicity in reproduction, (50) 510.

phases, effect on rainfall, (43) 417.

tide in atmosphere, (41) 211.

Lungs—

of horses, nodes and nodules in, (44)
76.

zinc content, (45) 64.

Lungworm disease of cattle, lesions in, (48)
85.

Lungworms—

in domestic animals, (47) 586.

in hogs, life history and habits, (49)
80.

in sheep, (41) 878; (43) Okla. 79;
(47) Okla. 883.

Luperina stipata, on corn, (42) Ohio 852.

Lupine—

bacteria, sensitivity to acid, (42) Wis.
324.

bread as wheat substitute, (42) 255.

silvery, studies, (43) Wyo. 783.

Lupines—

absorption of calcium salts, (41) 221.
acid content, relation to soil acidity,
(42) 424.

alkaloid content, factors affecting, (48)
622.

as affected by artificial light, (47) Md.
235.

as affected by carbonic acid gas, (44)
218.

debittered, digestibility and value for
milk production, (48) 274.

debittered, for fattening hogs, (45)
271.

effect on growth of yellow pine, (47)
644.

effect on soil acidity, (47) 723.

Lupines—Continued.

- effects of carbon dioxide on, (42) 816.
- flour from, analyses, (43) 458.
- for improvement of poor soils, (43) 321.
- germination as affected by organic substances, (41) 523.
- heredity and variation in, (47) 822.
- history of, (42) 233.
- inheritance in, studies, (42) 133.
- lime sensitiveness, (50) 426.
- liming experiments, (42) 523.
- new rot of, (46) 241.
- poisonous to livestock, (42) 879; (47) Nev. 786.
- seed production, (45) 740.
- sensitiveness to calcium, (42) 233.

Lupinus—

- arboreus, pathology of, (48) 451.
- argenteus, chemical examination, (49) Wyo. 476.
- spp., *Thielavia basicola* on, (49) 843.
- Lycaenidae, life histories, (47) 357.
- Lycoperdon furfuraceum, notes, (46) 544.
- Lycophotia margaritosa—
 - meteorological relations, (49) Minn. 759.
 - saucia, life history, (46) 660.
- Lycetidae, life history and habits, (48) 555.
- Lycetus brunneus, notes, (43) 456.
- Lycetus spp., life history and control, (44) 658.
- Lyda hypotrophica, notes, (41) 847.
- Lyda stellata, parasitism by tachinids, (49) 255.
- Lydella hyphantriae n.sp., studies, (49) 555.
- Lydella stabulans, parasitism by, (43) 858.
- Lye hominy, discoloration and manufacture, (47) 718.
- Lye, use as vermifuge, (43) Okla. 80.
- Lye, use in olive processing, (42) 113.
- Lygaeus, revision of genus, (45) 360.
- Lygidea mendax, *see* Red bugs.
- Lygocerus—
 - spp., bionomics and development, (45) 456.
 - stegmatus, parasitism, (44) Va. 756.
- Lygris diversilineata, studies, (44) U.S.D.A. 455.
- Lygus—
 - campestris, notes, (41) 354.
 - gibbosus, notes, (44) Oreg. 850.
 - pubulinus, notes, (44) 454.
 - pratensis, *see* Tarnished plant bug.
 - solani n.sp., description, (50) 154.
 - spp., notes, (42) Ariz. 357.
 - spp., remedies, (43) Ariz. 757.
- Lymantria monacha, outbreak, studies, (45) 554.
- Lymexylon dermestoides, notes, (47) 258.
- Lymidus varicolor, notes, (48) 252.
- Lymnaecia phragmitella, studies, (46) N.Y.Cornell 465.
- Lymphadenitis, caseous, diplococcus associated with, (49) 786.

Lymphangitis—

- chronic ulcerative, treatment, (42) 566.
- contagious, treatment, (41) 192.
- epizootic, studies, (41) 579; (42) 568; (43) 184, 583, 685; (44) 579; (45) 384, 881, 882; (48) 579.
- epizootic, treatise, (44) 477.
- in cattle, (41) 782; (44) 481; (45) 680; (47) Calif. 683; (48) Calif. 579; (50) 81.
- in horses, (47) 788, 884.
- treatment, (42) 75.
- ulcerative—
 - from Preisz-Nocard infection, (43) 885.
 - in sheep, (49) 80.
 - studies, (41) 87, 379, 479, 579; (43) 383.

Lymphocytes—

- action of serum on, (50) 379.
- function in nutrition, (46) 867.
- Lymphoid tissue, function in nutrition, (46) 867.
- Lyonetia sp. studies, (42) 650.
- Lyperosia exigua, notes, (50) 455.
- Lyperosia irritans, *see* Horn fly.
- Lyponyssus silvium, control, (45) Ind. 149.
- Lypsimena fuscata, notes, (43) 851.
- Lysalbinic acid, gold number determination, (43) 12.
- Lysimeter—
 - equipment, pitless, (45) 21.
 - experiments, (43) 127; (46) N.Y.Cornell 210; (48) 216.
 - installations at Craibstone farm, (46) 811.
 - investigations, (44) U.S.D.A. 124; (47) N.Y.State 516.

Lysin—

- as product of hordein, (41) 11.
- effect on starch hydrolysis, (48) 608.
- role in nutrition of chicks, (43) Ky. 72.
- role in nutrition of white rat, (44) 63.

Lysiphlebus testaceipes—

- larval stages, (49) 559.
- parasitism by, (44) Va. 756.

Lysoclor, use of, (42) 272.

Lysol, use as soil disinfectant, (42) 718.

Macacus rhesus, notes, (48) 253.

Macadamia nuts—

- culture, Hawaii, (44) 44; (48) 338.
- variety tests, (46) Hawaii 640.

Machaerota planitiae, notes, (47) 254.

Machine—

- for road finishing, (43) U.S.D.A. 388.
- for trimming camphor trees, (43) U.S.D.A. 90.

Machinery, *see* Agricultural machinery.

"Mac-Ken" nuts, oil of, analysis, (42) 115.

Mackerel, California, chemical study, (46) 466.

Macremphytus varians, mouth parts, studies, (46) 560.

- Macrobasia—*see also* Blister beetles.
 murina, notes, (41) 259.
 spp., notes, (46) U.S.D.A. 158.
- Macrocentrus—
 ancylivora n.sp., description, (50) 359.
 n.sp., notes, (44) U.S.D.A. 163.
 sp., notes, (47) Mass. 452.
- Macrocephococcus *loranthi* n.g. and n.sp., description, (42) 649.
- Macrocystis *pyrifer*, potash from, (50) U.S.D.A. 424.
- Macroductylus *subspinosus*, *see* Rose chafer.
- Macromischa *isabellae*, notes, (49) 550.
- Macrocnetha *onusta*, notes, (41) Conn.State 159; (44) 352.
- Macrophoma—
 palmarum, notes, (47) 547.
 reniformis, notes, (49) 547.
 sp., notes, (50) 143.
 tabaci n.sp., notes, (50) 248.
- Macropsis *virescens graminea*—
 life history, (42) 749.
 notes, (44) 351.
- Macrosiphum—
 cynosbati, notes, (41) Mich. 660.
 granarium, *see* Grain aphid.
 n.spp., descriptions, (43) Me. 160.
 pisi, control, (48) U.S.D.A. 457.
 ribiellum n.sp., description, (41) 850.
 solanifolii, notes, (41) 160, Va.Truck 662; Va.Truck 451; (47) Me. 159, 851; (49) Idaho 746.
 solanifolii, remedies, (41) 756.
 solanifolii, soap sprays for, (45) 148.
 solanifolii, transference of bean mosaic by, (48) 45.
 spp. on vegetable crops, (41) N.J. 255.
 spp., parasite of, (48) 753.
 spp., studies, (43) Me. 159.
 spp., tests of nicotin dust on, (50) N.J. 254.
- Macrosporium—
 attacking onion, (49) 839.
 carotae, control, (50) N.Y.State 546.
 on citrus, (46) 348.
 parasiticum, notes, (46) 145.
 parasiticum, pathogenicity, (50) 748.
 rot on onion, (47) 351.
 sarciniforme, studies, (44) 244.
 solani, control, (41) 51.
 solani, culture, (41) 152.
 solani, inoculation experiments, (45) 249.
 solani, notes, (41) 156; (42) 247; (43) 152; (44) 543, 647; (45) 47; (46) 148, 447, 451; (49) 46; (50) 550.
 sp., notes, (47) 44; (49) Ga. 346, Ky. 541.
 spp., notes, (49) 149.
 tomato n.sp., notes, (44) 155, 543.
- Madia, culture, (44) 138.
- Madieae, genera and species, studies, (41) 330.
- Magdalis *aenescens*, notes, (42) 751.
- Magnesia—
 and potash fertilization, (50) 724.
 application to soils, (42) 126.
- Magnesia—Continued.
 cement, physical properties, (43) 282.
 effects on soil potassium, (43) 127.
 experiments, (45) 624.
 fertilizing value, (49) 815.
 impregnated soils, (46) 316.
 injury to cereals, (49) 628.
- Magnesia-lime of soils, (45) 625.
- Magnesite—
 effect on sulphate loss from soil, (50) 522.
 fertilizing value on acid soils, (42) 330.
- Magnesium—
 and calcium metabolism, interrelations, (48) 755.
 and calcium ratio in soil as affected by wheat crop, (41) N.Dak. 124.
 antagonistic effects on respiration of organisms, (43) 820.
 arsenate, cause of injury from, (42) Mich. 355.
 arsenate, foliage injury from, (44) Mich. 144.
 arsenate, insecticidal value, (43) Colo. 158; (46) Mich. 443.
 arsenate, notes, (48) Mass. 346.
 arsenate, solubility in carbon dioxide, (41) 799.
 as affected by nitrification and sulfonation, (46) Ohio 430.
 assimilation, factors affecting, (48) 861.
 carbonate, effect on wheat, (48) 324.
 chlorid, effect on—
 concrete, (47) Wyo. 188.
 soil permeability, (47) 20.
 starch, (47) 128.
 compounds injurious to plants, (44) 519.
 deficiency, cause of sand drown, (48) 49.
 determination, (41) 313; (47) 804; (48) 11, 610.
 determination—
 in blood, (42) 712; (45) 415; (46) 416; (50) 615.
 in feces, (46) 417.
 in organic solutions, (43) 204.
 in saline media, (42) 710.
 in serum, (46) 203.
 in urine, (46) 417.
 indirect method, (42) 504.
 distribution in human blood, (48) 361.
 effect on potatoes, (50) 235.
 fertilizing value, (47) 818.
 fertilizing value for grapes, (42) 737.
 in fertilizers, rôle and use, (42) 723.
 in rain water, (49) 413.
 in soil extracts, effect of fertilizer salts, (43) Mich. 125.
 in virgin and cultivated soils, (42) 621.
 induced toxicity, transient nature of, (50) 625.
 loss from soils, (41) 214.
 metabolism of women, (48) 861.

Magnesium—Continued.

- nitrate, use for determining sulphur in soil, (49) 22.
- oxid dust, effect on soil, (49) Wash. Col. 209.
- oxid, effect on sulphate loss from soil, (50) 522.
- oxid, insecticidal value, (49) U.S.D.A. 449.
- production in United States, (50) 727.
- removal from soil, (46) N.Y.Cornell 210; (47) Ky. 122.
- rôle in cultivated plants, (47) 328.
- salts as soil amendments, (41) 326.
- salts, crust-forming action, (47) 124.
- separation from sodium and potassium chlorids, (44) 112.
- silicate, effect on wheat, (46) 717; (48) 324.
- silicate, fertilizing value, (48) 721.
- soil, as affected by gypsum, (47) 512.
- soil, as affected by sulfonation and nitrification, (41) 325.
- sulphate—
 - effect on concrete, (47) Wyo. 188.
 - effect on efficacy of carbon tetrachlorid, (50) 684.
 - effect on Portland cement, (47) 291.
 - effect on soil solubility, (41) Mich. 512.
 - effect on starch, (47) 128.
 - fertilizing value, (45) 625; (46) 521.
 - in arsenic poisoning, (45) 178.
 - use to prevent nitrogen loss from manure, (44) 817.
 - v. high-calcium limestone, (41) Del. 137, 520.

Magnesium-calcium interchange, (50) 819.

Magnollas, time for transplanting, (43) Mo. 142.

Maguey—

- as paper-making material, (41) 732.
- culture and uses, (43) 826.
- grading, baling, and inspection, (50) 434.
- industry in Philippines, (44) U.S.D.A. 527.

Mahoe wood, durability tests, (43) 44.

Mahoganies, true, revision, (43) 241.

Mahogany—

- identification and substitutes, (47) U.S.D.A. 443.
- identification of, (42) 840.
- microscopic characteristics, (41) 541.
- parasitic nematode on, (44) 347.
- species, descriptive accounts, (41) 541.
- Venezuelan, new species, (42) 642.
- wood, structure and strength, (48) 239.

Mahua cake—

- fertilizing value, (41) 816.
- nitrification, (49) 117.

Maidism in guinea pigs, (41) 562.

Maine Station—

- bulletins, index, (44) Me. 195.
- finances, index, and reports, (45) 496.

Maine Station—Continued.

- miscellaneous information, (50) 95.
- notes, (42) 497; (43) 497, 899; (44) 496; (46) 795; (50) 96.
- report, (41) 98.
- work and publications, (48) 497.
- Maine University, notes, (45) 199; (46) 795; (47) 99.
- Maize, *see* Corn.
- Mal de caderas of the horse, treatment, (48) 882.
- Malacosoma—*see also* Tent caterpillar.
 - castrensis, notes, (43) 853.
- Malangas, improvement, (45) 228.
- Malaria—*see also* Anopheles and Mosquitoes.
 - control, relation to drainage, (41) 482; (43) 85; (46) 460.
 - control, rôle of top minnows in, (46) 157.
 - economic loss caused by in irrigation district, (41) 553.
 - in California, (42) 56.
 - in Egypt, (42) 158.
 - in Macedonia, (45) 656.
 - in rice fields in California, (42) 361.
 - inoculation, (43) 854.
 - lessons on, (41) 396.
 - mosquito survey, Calif. (44) 752; (47) 655.
 - mosquito survey in California, (42) 548.
 - papers on, (45) 57.
 - parasite in blood of buffalo, description, (42) 381, 679.
 - parasites, (45) 555.
 - parasites in mosquitos, longevity, (47) 554.
 - prevention, (47) 361.
 - prophylaxis, rôle of cattle in, (43) 454, 853; (45) 555.
 - relation to the army, (44) 552.
 - transmission by Anopheles, (43) 55.
 - treatise, (44) 552.
- Malarial blood, fat content, (41) 764.
- Male as spreader of genital infections, (50) 783.
- Malic acid—
 - determination in fruit juices, (49) 805.
 - effect on molds, (45) 463.
 - inactive, as food acidulent, (50) 58.
- Mallein—*see also* Glanders.
 - antigenic variations and standardization, (47) 881.
 - formation, culture media for, (44) 478.
 - injection as affected by glanders, (47) 681.
 - injections, formation of antibodies, (47) 383.
 - reaction, nature of, (42) 777.
 - test, intradermal, effect on subsequent complement fixation tests, (43) 881.
 - tests for glanders, (44) 779.
 - tests, ophthalmic and intradermic, (48) 82.
- Mallophaga on chickens, control, (47) 53.
- Mallow rust, studies, (49) 651; (50) 250.
- Mallows, mucilage in, origin, (43) 132.

Malnutrition—see also Underfeeding and Undernutrition.

- and health education, (44) 860.
- campaign against, (50) 796.
- cause and treatment, (45) 568.
- clinic in applied dietaries, (44) 666.
- determining, (50) 764, 854.
- in children, (42) 864.
- in children, intestinal flora, (42) 166.
- in infants, relation to rickets, (42) 367.
- relation to thymus in birds, (42) 165.
- relation to tuberculosis, (46) 869.
- severe infantile, metabolism in, (46) 762.

Malt—

- diastase, effect on sorgo juice, (50) 509.
- diseases and pests, (46) 52.
- extract, effect on calcium retention of infants, (41) 561.
- extract, value, (49) 663.
- flour, diastatic activity, studies, (49) 13.
- grain, dried, analyses, (44) Mich. 568; (47) N.J. 570.
- green, antiscorbutic value, (41) 561.
- preparations, analyses, (45) 414.
- products as antiscorbutics, (42) 463.
- soup extract as antiscorbutic, (45) 664.
- sprout poisoning, (49) 279.
- sprouts, analyses, (41) Ind. 564, N.Y. State 868; (42) 263, 560; (43) N.J. 69, N.J. 672; (44) Mich. 568; (45) N.Y. State 469, N.J. 774; (47) N.J. 570; (48) 68.
- stored, destruction by *Trogoderma khapra*, (47) 258.

Malta fever—see also Undulant fever.

- and abortion, relationship, (49) 380; (50) 183.
- case in Baltimore, (50) 684.
- in Phoenix, Arizona, (48) 482.
- treatment with collargol, (46) 277.

Maltase, optimum temperature, relation to acidity of medium, (47) 127.

Maltose—

- detection and identification, (47) 205; (49) 112.
- determination by Barfoed's solution, (45) 806.
- determination in blood, (45) 110.
- determination, use of iodine in, (48) 414.
- formation in sweet potatoes, (50) 711.

Malts, diastatic power, (45) 504; (48) U.S.D.A. 310.

Malva parviflora, cause of staggers, (49) 178.

Mammalian seminiferous tubule, morphology, (42) 559.

Mammals—see also Animals and specific animals.

- age and chemical development, (50) 569.

Mammals—Continued.

- development, disturbances produced by radium, (49) 567.
- distribution, (48) 549.
- distribution, effect of winter inactivity, (42) 747.
- domestic, acetoneuria in, (43) 879.
- domestic, physiology, textbook, (45) 870.
- domestic, spermatogenesis, (43) 669.
- hair, structural characteristics, (44) 467.
- in Queensland, (46) 49.
- in South Africa, (44) 348.
- life history studies, desirability, (42) U.S.D.A. 354.
- morphology of female sex organs, (46) 266.
- oestrus and ovulation in, (50) 531.
- of District of Columbia, (49) 448.
- of Panama, (43) 849.
- of Pribilof Islands, (49) U.S.D.A. 652.
- of Utah, (49) 756.
- reproduction in, treatise, (48) 661.
- small, of Colorado, (46) 151.
- South African, treatise, (46) 245.
- spermatozoa in, survival of motility, (46) 673.

Mammary—

- development in a doe kid, (41) 79.
- gland, development, (45) 67.
- gland, relation to embryonic development, (41) 862.
- gland, studies, (41) 173, 174; (42) 666, 667.
- secretion, (48) 861.
- secretion, effect of diet, (45) 863.
- secretion, physiology, (41) 79.

Mammea americana, notes, (46) 737.

Mammitis—

- bovine, principles, (49) 178.
- contagious, in ewes and goats, (46) 777.
- in cows, (47) 283, 681.
- infectious, of cattle, (49) Oreg. 582.
- studies, (41) Mich. 681.

Man—

- adaptation to high altitudes, (43) 564.
- age and chemical development, (50) 569.
- basal metabolism, (41) 760.
- calcium requirements, (44) 563.
- effect on animal life in Scotland, (45) 55.
- emotional and metabolic stability, (44) 467.
- endoparasites of, (50) Minn. 152.
- energy exchange in, (41) 563.
- food requirements, (42) 658.
- glycogen and glutamine synthesis in, (47) 563.
- hookworms in, control, (48) 151.
- in agriculture, treatise, (49) 191.
- infection by organism resembling *Bacillus suispestifer*, (48) 482.
- infestation by mouse *oxyuris*, (42) 847.

Man—Continued.

inheritance of webbed toes in, (48) 66;
(50) 530.

lepidopterous enemies, (50) 156.

parasites of, (48) 877.

rat mite attacking, (50) U.S.D.A. 159.

utilization of vegetable calcium and
phosphorus, (47) 763.

vitamin requirements, (42) 366; (48)
360.

Manatha spp., notes, (42) 361.

Mandarin—

canker, relation to stomata structure,
(47) 546.

disease, new, (48) 746.

disease, notes, (49) 150.

juice, bactericidal power of, (42) 7.

Mandarines, variety tests, (47) Calif. 640.

Manganese—

absorbing power of soil for, (44) 21.

absorption and elimination, (45) 167.

agrolologic study, (49) 215.

and vitamins, association, (50) 463.

as affected by nitrification and sulfo-
fication, (46) Ohio 430.

compounds, effect on crops, (44) 819;
(49) 23.

compounds, fertilizing value, (42) 222.

distribution in plants, (49) 221, Ky.
520.

effect on—

action of phosphatic slag, (48)
122.

plant growth, (41) Hawaii 149;
(42) 525.

wheat, and sources of, (41) 521.

fertilizing value, (48) 623.

in beets, (46) Colo. 29.

in food materials, (45) 665.

in fruits and vegetables, (47) 502.

in human tissues and blood, (43) 615.

in leaves, variations with age, (50)
221.

in legumes, (45) 803.

in phosphatic slag, (43) 127.

in plants, (48) Ky. 126; (50) 21.

in plants, localization, (50) 221.

in seeds, (49) 202.

in soil, effect of sulfonation and nitr-
fication, (41) 325.

in soils of Netherlands, (50) 514.

methods of determination, (45) 505.

oxid crystals from Virginia, (41) 420.

removal from soil by drainage, (47)
Ky. 122.

salts as soil amendments, (41) 326.

salts, reaction of, (41) 504.

salts, simplification of reaction, (43)
803.

soils, methods of handling, Hawaii
(41) 138, 148.

steel, use in farm tractors, (42) 783.

sulphate, effect on alkali salts, (42)
Calif. 813.

sulphate, increased concentrations, ef-
fect on plant growth, (49) 730.

Manganese—Continued.

toxicity in acid soils, (42) 431, 816.

value to plants, (47) 820.

Mange—*see also specific hosts.*

and allied mites, handbook, (49) 76.

in white rats, remedy, (45) 387.

occurrence in Great Britain, (50) 182.

of horses, notes, (50) 582.

parasitic, notes, (41) 286; (44) 180;
(46) 773; (49) 179, 278.

parasitic, papers on, (43) 81.

treatment, (42) 272.

Mangel—

diseases, notes, (43) 45.

rust, notes, (46) 741.

seed, home-grown, (47) 898.

seed identification in sugar beet seed,
(46) 134.

Mangels—

analyses, (43) 63.

as affected by potassium salts, (43)
630.

as affected by sodium chlorid, (43)
630.

as affected by sodium nitrate, (48)
630.

as chinch bug control crop, (49) Ill.
431.

as forage crops in Denmark, (43) 177.

breeding experiments, Can. (43) 735;
(48) 31.

cost studies, (50) Can. 432.

culture, (44) Hawaii 29; (45) U.S.D.A.
530; (48) N.Dak. 224; (49) West.
Wash. 395.

culture and storage, (45) Wis. 229.

culture directions, (47) Minn. 334.

culture experiments, (41) 229, 334,
Can. 528; (42) Wyo. 135, N.Dak.
732; (44) Alaska 329; (45) Kans.
33, Can. 823.

culture in British Columbia, (42) 733.

digestion coefficients, (43) 373.

effect of preceding crop, (46) R.I. 233.

effect on following crop, (41) R.I.
135; (49) 231.

feeding value, (46) 765.

fertilizer experiments, (41) R.I. 135,
228, 229, 334; (43) 231, Can. 735;
(45) 532; (46) 131; (47) Wash. 124;
(49) Can. 734; (50) West.Wash.
520.

fertilizer requirements, (42) 327.

field tests in Nova Scotia, (41) 729.

food value and vitamin A deficiency,
(49) 262.

liming experiments, (44) R.I. 32; (46)
131.

nutritive value, (47) Calif. 668.

potash for, (41) Mass. 21, 629.

rotation experiments, (42) 230; (44)
632; (46) 131.

seed production, (43) Can. 735; (45)
832.

seed production in Denmark, (42) 135.

seed tests, Can. (43) 735; (45) 823.

Mangels—Continued.

- sodium for, (41) R.I. 426.
- storage experiments, (48) Calif. 529.
- v. dried beet pulp for cows, (50) Can. 375.
- varieties, (41) Idaho 226, Nev. 228.
- varieties, yields, (47) Mont. 131.
- variety tests, (41) 334; (42) N.Dak. 732, Minn. 824; (43) 232, Can. 735; (44) Alaska 523; (45) 532, 828; (46) 131, 227; (47) Minn. 332, Alaska 527, Calif. 631; (48) Can. 31, Can. 227, Minn. 331; (49) Alaska 426, Can. 734, 825; (50) Minn. 133, Can. 432, Can. 533.
- yields, (43) Minn. 824; (46) 533; (50) Can. 432.

Manger for experimental cattle feeding, description, (49) 778.

Mango—

- bark discolorations, (50) 150.
- beetle, blossom destroying, (44) 554.
- flies, control, (42) 736.
- hopper, control, (43) 51; (47) 357.
- hopper, notes, (47) 254.
- leafhoppers, natural enemies, (48) 552.
- mildew, (42) 46.
- ripe rot, control, (41) 841; (45) 443.
- scale insects, control, (43) 54.
- seed weevil, notes, (44) Hawaii 60.
- weevil, control, (48) Hawaii 355.
- weevil in Bengal, life history, (42) 159.

Mangoes—

- antiscorbutic value, (42) 163.
 - budding experiments, (42) 736.
 - culture, (45) Guam 43, 44, P.R. 638.
 - culture experiments, (41) 650; (42) 736; (43) 40; (48) Hawaii 338.
 - culture in Florida, (42) 737.
 - culture in India, (42) 442.
 - culture in Sind, (41) 837.
 - girdling, (48) P.R. 235.
 - grafting, (50) 543.
 - in Australia, weevil pest, (46) 254.
 - inarching of, (44) 535.
 - insects affecting, (43) 52; (47) U.S. D.A. 359.
 - red-banded thrips affecting, (49) 555.
 - scale insects on, control, (47) 53, U.S. D.A. 359.
 - shipping experiments, (44) P.R. 441.
 - smudging, effects, (49) 835.
 - studies in India, (46) 640.
 - summary, (44) 537.
 - treatise, (45) 643.
 - varieties, (44) Hawaii 44, P.R. 235, P.R. 441; (50) P.R. 540.
 - varieties in India, (48) 839.
 - variety tests, (46) Hawaii 640.
- Mangrove swamps of Philippines, (42) 142; (48) 842.
- Manila rope, strength requirements, (41) 884.
- Manila rope, use and care, (47) 592.
- Manioc, *see* Cassava.

Mannan, salep, coefficients of digestibility, (43) 366.

Mannite—

- decomposition, capacity of soil for, (49) 118.
- determination in soil extracts, (49) 804.

Mannitol—

- fermentation products, (48) 108.
- formation, (42) 709.
- oil, nutritive value, (42) 757.
- production in silage, (46) 804.

Mannose—

- fermentation of, (43) 610.
- from white spruce cellulose, (49) 206.
- preparation, (47) 407.
- preparation from ivory-nut, (46) 612.
- yeast, (41) 508.

Manure—*see also* Cow, Poultry, Sheep, *etc.*

- action on crops, (46) 424.
- ammonification, bacteria involved in, (48) N.Y.State 20.
- ammonification in soil, (41) 20; (42) N.Y.State 325.
- and green manure, comparison, (48) 218.
- and manuring, collected leaflets, (48) 818.
- and sewage fertilizer, comparison, (46) 319.
- and sulphur composts, effect on green-sand potash, (41) 799.
- application, (41) N.Y.Cornell 22; (44) Mass. 627.
- application, furrow system, (46) 424.
- application, time for, (43) 24.
- artificial, (46) 217.
- as affected by phosphate, (44) 217.
- as top-dressing v. plowing under, (48) N.Dak. 216.
- Bacillus botulinus* in, (49) 860.
- best use in a rotation, (49) Ohio 323.
- composition, (41) 424.
- conservation, (41) 322, 424; (42) 19, 721.
- conservation—
 - and application in citrus groves, (43) 239.
 - and use, (43) Mo. 124; (47) 815.
 - in Spain, pits for, (43) 423.
 - in Sweden, (43) 423.
- decomposition, (44) 511.
- dispensability in farming, (47) 25.
- economy tests, (46) 335.
- effect on—
 - azofication, (41) 125.
 - carbon dioxid production in soil, (43) 321; (48) 126; (49) 421.
 - cellulose decomposition, (48) 217.
 - green manure, N.J. (42) 827; (44) 321.
 - hardpan subsoil, (49) Okla. 420.
 - nitrification in soils, (43) Tex. 725.
 - nitrogen-fixing power of soil, (50) Utah 120.

Manure—Continued.

effect on—continued.

- quality of potatoes, (46) 441.
- root systems in hardpan subsoils, (47) Okla. 815.
- soil bacteria, (41) Del. 130, Ga. 130.
- soil composition, (41) 420.
- soil moisture, (43) 722.
- toxicity of alkali salts, (41) 322; (42) Calif. 813.
- fertilizing value, (41) Mass. 21, N.Y. Cornell 22, Kans. 32, Kans. 33, Ark. 130, Del. 136, N.Dak. 139, N.Mex. 139, Idaho 225, 424, Nebr. 433, Can. 516, Mo. 624, Mo. 644, 814, 822, 825, 826; (42) Guam 37; (43) Okla. 32, Tex. 37, Utah 218; (44) N.Dak. 512; (45) Guam 23, Ohio 119, Ohio 232, Ohio 233, 623, 727; (46) R.I. 213, Oreg. 215, 818; (47) 24, 25, Minn. 124, Miss. 217, Minn. 320, Wis. 418, U.S.D.A. 429, Ark. 519, R.I. 725; (48) N.Dak. 29, N.Dak. 216, Minn. 321, Minn. 322, Mo. 616; (49) Kans. 427, Tex. 436; (50) Minn. 121.
- fertilizing value in Bombay, (42) 518.
- flies breeding in, (42) 453.
- for greenhouse crops, (41) Ill. 147.
- for improvement of alkali soils, (44) U.S.D.A. 419.
- for Iowa soils, (42) 516.
- for manganese soils, (41) Hawaii 138.
- for permanent meadows, (41) Mass. 21.
- fresh v. rotted, N.Dak. (41) 139, 823.
- from city stables, fertilizing value, (42) 325.
- heaps, vegetation around, (43) 430.
- hot composted, fertilizing value, (46) 818; (50) 421.
- in Egypt, treatment and storage, (46) 518.
- liquid—
 - ammonia nitrogen from, (43) 220.
 - conservation, (42) 326, 721; (43) 423.
 - conservation and use, (44) 816.
 - conservation in peat, (41) 722.
 - conservation of nitrogen in, (41) 20; (42) 519; (50) 721.
 - conservation with gypsum, (46) 818.
 - conserved with formalin, effect on plants, (46) 518.
 - decomposition, (44) 511.
 - effect on nitrogen content of soils, (42) 425.
 - fertilizing value, (44) 217, 816; (47) 726.
 - nitrogen content, (42) 427.
 - nitrogen losses from, (43) 323; (44) 816; (46) 714; (47) 515; (48) 217; (49) 118.
 - notes, (41) 626, 721.
 - of bullocks, value, (41) 814.

Manure—Continued.

liquid—continued.

- pumps, tests, (49) 486.
- specific weight and nitrogen in, (48) 425.
- tanks, plans, (42) 86.
- treated with copper and mercury, fertilizing value, (44) 215.
- use in Europe, (50) 621.
- use of calcium chlorid with, (43) 628.
- value on peat soil, (45) 735.
- making and use, (43) 518.
- mule, effect of weathering and storage, (43) Mo. 721.
- nitrification, studies, (42) 519, 524.
- nitrogen losses from, (44) 816; (47) 515; (49) 118; (50) 421.
- nitrogen losses from, prevention, (45) 623; (48) N.Y. State 20, N.Y. State 21, 217.
- nitrogen, nitrification in soil, (45) 423.
- nitrogen preservation in, (47) N.Y. State 516.
- noninoculation by alfalfa feeding, (42) Wis. 325.
- organic, growth-promoting substances in, (43) 816.
- phosphated, use, (44) 514.
- production and use on dairy farms, (48) Ill. 21.
- production, care, and use, (41) 322; (50) 322.
- quantity experiment, (48) Minn. 321.
- radio, fertilizing value, (47) 521.
- reducing amount used, (50) Mass. 642.
- refuse, analyses, (43) 28.
- reinforcement, (48) West.Wash. 218.
- residual effect on clover, (41) 131.
- spreader tests, (42) 186.
- stored, temperature, (48) Mo. 616.
- substitution by other fertilizers, (47) R.I. 419.
- substitution of green crops and fertilizers for, (48) 21.
- treatise, (43) 621; (45) 24.
- treatment with sodium arsenite, (41) 625.
- use, (41) 626; (45) Mo. 24, Ohio 119; (49) R.I. 510, Wis. 623.
- use, as affected by liming, (44) 215.
- use in New Jersey, (42) 291.
- use in reclamation of alkali soils, (49) U.S.D.A. 622.
- use on meadows, (50) 434.
- use on sand hill land, (41) 813.
- v. fertilizers, (42) N.Y. State 326; (46) 623; (47) La. 420, 816; (48) Can. 218.
- v. fertilizers for market gardening, (43) R.I. 643.
- v. fertilizers for Maryland soils, (43) 815.
- v. manure plus fertilizer, (47) N.H. 437.
- v. sodium nitrate, (42) 124.
- whale, nitrification, (46) 516.

- Manurial values, unexhausted, determination, (45) 217.
- Manuring—
 and insect control, (42) 152.
 experiments, (49) Ohio 724.
 experiments on peat soil, (45) 735.
 for reclamation of push soils, (43) Iowa 21.
 rates, Minn. (47) 124; (48) 322, 325.
 treatise, (41) 21.
- Maple—
 borer, notes, (50) Conn.State 50.
 case-bearer, notes, (48) 54; (49) N.Y. Cornell 355.
 cotyledon disease, (42) 46.
 disease, (46) 44.
 frustum form factor, (41) Vt. 47.
 leaf blotch, notes, (44) 48.
 leafhopper, Japanese, notes, (44) 351.
 leaves, developmental history, (42) 130.
 products, chemistry of, (44) 414.
 products, composition and adulteration, (45) 112.
 products, lead number, (50) 196.
 sand, organic acids of, (46) 308.
 sap products, marketing, (48) Vt. 687.
 scale, cottony, notes, (47) Conn.State 156.
 scale, gloomy, notes, (41) N.C. 660.
 seed, analyses and composition, (46) N.Y.State 308.
 seeds, physiological study, (44) 323.
 sesian, notes, (50) Conn.State 50.
 silver, distillation, effect of adding chemicals, (47) 208.
 silver, inosite hexaphosphoric acid in, (44) 410.
 sirup and sugar, cost of production, (49) 692.
 sirup and sugar production, (50) U.S. D.A. 744.
 sirup manufacture, (44) 807.
 sirup, production, Mich. (42) 397; (49) 43.
 sugar, root development, (48) 42.
 sugar sand, preparation for market, (42) 713.
 twig pruner, *see* *Elaphidion villosum*.
 wood, abnormalities of growth, cause, (50) 428.
 wood analysis, (42) 7.
- Maples—
 as affected by sodium chlorid, (43) 344.
Cytospora chrysosperma on, (46) 850.
 distinguishing characteristics, (46) 341.
 kerosene injury to, (43) 732.
 reproduction in, (47) 126.
 variegation in foliage, (43) 729.
- Maps, topographic, and sketch mapping, (43) 887.
- Marasmia trapezalis, notes, (46) Guam 748.
- Marasmius—
 pernicius, notes, (43) 349.
 plicatus on sugar cane, (43) La. 348.
- Marasmius—Continued.
 sacchari, notes, (41) 841; (42) 745; (44) 150; (45) 443, 449; (50) 352.
 sp., notes, (41) 450; (46) 45.
 stenophyllus, notes, (42) 49.
- Maravalia pallida n.g. and n.sp., description, (48) 242.
- Marble, etching by roots, (42) 25; (43) 422.
- Mares—
 brood, feeding and management, (44) N.Y.Cornell 572.
 brood, for farm work, (47) 278.
 feed records, (41) Can. 570.
 immunization against abortion, (49) Ky. 581.
 native, breeding, (46) Guam 763.
 sterility in, (49) Ky. 272.
 thoroughbred, length of gestation period, (50) 174.
- Margarin—*see also* Oleomargarin.
 analysis, (41) 412; (49) 505.
 benzoic acid in, determination, (47) 806.
 fats, rancidity, (46) 109.
 imports into United Kingdom, statistics, (42) 774.
 manufacture, emulsion problems, (47) 15.
 notes, (46) 276.
 nut, digestion by children, (42) 61.
 treatise, (44) 258.
- Margarins—
 from hardened fats, (41) 362.
 moisture in, determination, (42) 210.
 nut, inspection and analyses, (41) Conn.State 170.
 Valenta test and Crismer number, (41) 805.
- Margarodes formicarum, notes, (48) V.I. 354.
- Margarodinae, notes, (49) 851.
- Margaropus—
 annulatus, *see* Cattle tick and Texas fever parasite.
 australis, notes, (43) 82.
- Marguerites, disease of, (44) 248.
- Marigold, Mexican, control in South Africa, (46) 227.
- Marine—
 animals, zinc and copper in, (49) 258.
 organisms, copper content, (44) 556.
 organisms, zinc in, (46) 260.
 products of commerce, treatise, (50) 709.
 salts, fertilizing value, (41) 724.
- Marjoram, adulteration by wild thyme, (42) 415.
- Market—
 analysis, principles and methods, (46) 693.
 and farm prices, (48) U.S.D.A. 92.
 Center, in Washington, D. C., operation, (49) 190.
 diseases of vegetables, (43) 751.
 distribution, defects in, (47) 866.

Market—Continued.

gardening—*see also* Gardening and Truck farms.

demonstration projects, (42) N.J. 835.

information, Federal, dissemination, (45) U.S.D.A. 798.

inspection of perishable products, (48) U.S.D.A. 890.

news services, (48) U.S.D.A. 890.

project, postal, outlined, (44) 90.

reports, U.S.D.A. (41) 672, 695; (42) 492, 690, 896; (43) 194, 294, 490,

595, 694, 794; (44) 91, 192, 294, 388, 491, 593, 693, 894; (45) 89,

193, 294, 396, 493, 695, 897; (46) 91, 192, 390, 496, 596, 789; (47)

94, 194, 395, 492, 693, 797, 895; (48) 189, 294, 390, 492, 790; (49)

90, 294, 390, 594, 693, 793, 892; (50) 92, 294, 491, 691, 894.

stations, use of, (43) U.S.D.A. 490.

statistics, (46) U.S.D.A. 290.

Marketing—*see also special products.*

advantages of rural motor truck routes, (42) U.S.D.A. 289.

advantages of standardization in, (42) 895.

agricultural products, (45) 594; (46) 593.

and cooperative advertising, (45) 396.

and distribution, (50) 491.

and farmer movements, (48) U.S.D.A. 890.

banker's part in, (43) 294.

bureaus, proposed legislation, (42) 289.

by cooperative sales companies, (48) Wis. 789.

by federations, (44) Wis. 692.

college course in, function, (47) 897.

cooperative, (41) 341, 593, Ill. 834; (44) 91, U.S.D.A. 91, Kans. 386, Ill.

387, W.Va. 489; (47) 296, 895; (49) 190; (50) 894.

cooperative—

and price determination, (46) 594.

demonstrations, (43) U.S.D.A. 490.

discussion, (50) 197.

fundamentals, (48) U.S.D.A. 890.

in California, (42) 440; (47) 296.

in Chautauqua-Erie grape belt, (42) N.Y.Cornell 442.

in United States, (50) 291.

in Wisconsin, (45) 493.

of cotton, (44) 691.

of woodland products, (43) U.S.D.A. 345.

organizations, safety in, (48) 94.

outlook for, (47) 393.

treatise, (50) 192.

course in, (47) 599.

criteria of efficiency, (45) 595.

economics of, (47) 894.

education, (49) 797.

effect of farm storage, (50) 97.

efficient, textbook, (46) 289.

Marketing—Continued.

farm produce direct, (42) 492.

functions, (48) U.S.D.A. 890.

home-canned produce, (42) 616.

in Maryland, (44) 894.

in Minnesota, (45) 193.

in North Carolina, N.C. (41) 94, 294,

492, 695; (42) 89, 392, 594, 791,

896; (43) 394, 595, 794; (44) 491,

594, 791; (45) 193, 493; (46) 390,

595, 789; (47) 94, 296, 493, 797;

(48) 93, 790; (49) 294, 489, 793;

(50) 92, 294, 793.

in Ohio, State activities, (42) 895.

in Texas, (41) 591.

in Victoria, (42) 593.

laws in New York, (42) 291.

methods and policies, treatise, (46) 594.

national standards for, (45) 395.

need of middlemen in, (42) 289.

northwestern apples, treatise, (50) 393.

of Argentina's wheat, (48) 492.

of food products, retail profits, (45) Wis. 85.

of grain, plan, (45) 595.

of seeds, feeds, and fertilizers in car lots, address, (42) 291.

organization of Federated Fruit and Vegetable Growers, (50) 393.

organization, problems, (50) 392, 594.

organizations, (43) N.C. 490.

plan for improvement, (46) 192.

principles, (50) 593.

principles, treatise, (45) 897; (48) 788.

problems, (43) 489; (49) 892.

problems and methods, textbook, (44) 893.

problems, rôle of commission shops in, (49) 294.

relation to economics, (48) 686.

roadside, in Connecticut, (50) 91.

standard grades in, (45) U.S.D.A. 798.

standardization and organization, (44) 91.

studies at experiment stations, (46) 610.

system for agricultural products, (49) 892.

Markets—

American livestock, development, (48) 390.

for New Hampshire farmers, (42) 289.

foreign, and the American farmer, (44) 690; (48) 892.

foreign, farmer's interest in, (45) U.S.D.A. 798.

futures in, effect on grain business, (42) 290.

jobbing, of Philadelphia, (49) U.S.D.A. 90.

municipal, (41) 593.

organized produce, treatise, (48) 788.

public, open types, (46) U.S.D.A. 492.

public, studies, (43) Wash. 794.

Marl—

- and lime, comparison, (42) 523.
- as mineral feed substitute, (44) Ohio 175.
- fertilizing value, (49) 818.
- handling, (47) Mich. 196.
- production and prices in 1918, (43) 631.
- production and sale, (42) 19.
- production in United States, (44) 130; (45) 816; (50) 727.
- use in road construction, (50) 386.

Marlea begoniifolia leaves, intumescences on, (47) 327.

Marls—

- analyses, (45) Can. 815; (49) 512.
- analysis methods, (44) 203.
- carbon dioxid determination in, (44) 203.
- containing magnesia, fertilizing value, (42) 127.
- of North Carolina, (46) 521.
- use as fertilizers, (45) 121.

Marmalades—

- adulterants, detection, (42) 415.
- and artificial marmalades, (41) 66.
- citrus fruit, recipes, (48) U.S.D.A. 13.
- insoluble solids in, determination, (42) 415.
- manufacture, (47) 112.
- preparation of fruit juices for, (47) Calif. 613.
- recipes, (47) 113.

Marog, effect on nitrification in soil, (50) 721.

Marsh—

- border soils, chemical composition, (43) 22.
- gas, origin, (41) 720.
- plow, development, (48) 196.
- soil, drained, studies, (47) 512.
- soils—
 - drainage experiments, (46) 319.
 - fertilizer experiments, (42) 17; (43) 22; (50) Can. 533.
 - improvement, (42) Wis. 512.
 - in Wisconsin, development, (44) 623.
 - irrigation experiments, (42) 17.
 - profile structure, (45) 325.
 - reclamation and cultivation, (46) 318.

Marsonia—

- juglandis in walnut branches, (47) 541.
- juglandis, overwintering, (46) 851.
- perforans on lettuce, (43) 152.
- potentillae, notes, (47) 249; (48) 647.

Marsupials—

- male meiotic phase in, (50) 329.
- spermatogenesis in, (50) 329.

Martin roost in Washington City, (41) 547.

Marunguey, notes, (49) 586.

Maryland—

- College, notes, (43) 99, 299.

1761—31—25

Maryland—Continued.

- Station, notes, (41) 100, 199, 700, 899; (42) 497; (43) 299; (49) 196.
- Station, report, (43) 197; (45) 198; (47) 299; (49) 599; (50) 898.
- University, notes, (43) 99; (45) 199; (48) 898.

Masicera senilis, notes, (48) 854.

Masonry structures and foundations, design, (48) 386.

Massachusetts—

- Agricultural College semicentennial, editorial, (45) 1.
- College, notes, (41) 199, 398, 498; (42) 497; (43) 199, 497, 699; (44) 496, 699; (45) 199; (46) 395; (47) 99, 398, 698, 899; (48) 696, 796; (50) 96, 498, 798, 899.
- Cranberry Station, report, (47) 497.
- Horticultural Society, library catalogue, (47) 830.
- Station, bulletin summary, (48) 396; (49) 495.
- Station, notes, (41) 398, 498, 700, 899; (42) 398; (43) 199, 699; (45) 96, 199; (46) 196, 395, 699; (47) 99, 398, 698; (48) 696; (50) 96, 498.
- Station, report, (41) 98; (42) 396; (44) 495; (46) 96; (48) 693; (50) 696.

Massospora cicadina, studies, (41) 456.

Mast cell in lower vertebrates, (50) 783.

Mastitis, *see* Mammitis.

Mastotermes darwiniensis, notes, (45) 853.

Matches and matchwood production, (46) 237.

Maté, *see* Yerba maté.

Material handling cyclopedia, (47) 189.

Materials, strength, treatise, (47) 389.

Maternity in rural Wisconsin, (41) 794.

Mathematics for students of agriculture, (45) 899.

Matricaria nigellaefolia, poisonous to cattle, (46) 776.

Matsap pan as source of nitrate, (49) 123.

Matsucoccus—

- acalyptus n.sp., description, (45) 360.
- fasciculensis n.sp., description, (42) 649.

Matthiola—

- doubleness in, (44) Calif. 726.
- incana, origin of full doubleness in, (47) 524.
- mutation in, (42) 141.
- sp., effect of soil fertility on bloom, (46) 735.
- varieties, inheritance in, (46) 223.

Mäule reaction for distinguishing woods, (47) 443.

May beetle—*see also* Lachnosterna, Phyllophaga, and June beetle.

economy and forestry, (42) 152.

monograph, (47) 551.

May beetles—

- control, (41) 847.

May beetles—Continued.

- papers on, (46) 51.
- studies, (49) Miss. 454.
- wingless, notes, (41) 666.

Mayetiola destructor, *see* Hessian fly.

Mayonnaise, emulsification in, (46) 258.

Meadow—

- caterpillar, studies, (47) Me. 161.
- fescue, *see* Fescue.
- hay, fertilizer experiments, (46) 726.
- plant bug, studies, (41) Me. 162; (43) 256.
- soils, fertilizer experiments, (46) 319.
- soils, nitrogen requirements, (45) 816.

Meadows—*see also* Grassland and Pastures.

- analyses, (44) 434.
- changes in botanical composition, (45) 736.
- condition in England, (46) 129.
- culture experiments, (43) Wash. 436.
- drainage, (41) 230.
- fertilizer experiments, (43) Ohio 322; (44) 214; (46) Del. 624, 726; (47) 322; (50) 122, 433, Can. 533.
- for Northern States, (44) U.S.D.A. 332.
- from waste land, (41) 231.
- ground water control on, (42) 29.
- hardpan subsoil treatment, (46) 531.
- in France, treatise, (42) 437.
- length of life, (50) N.Y.Cornell 230.
- liming experiments, (42) 523.
- management, (47) Del. 432.
- on peat soils, grass mixtures for, (42) 733.
- papers on, (46) 437.
- permanent, in Denmark, (46) 437.
- run-out, top-dressing experiments, (46) Conn.State 318.
- seeding experiments, (42) Mass. 326.
- top-dressing experiments, (41) Mass. 21.
- upland moor, seeding, (48) 627.
- weed control in, (50) 338.
- wild, reclamation, (43) Oreg. 21.

Meal from grape seeds, (45) U.S.D.A. 209.

Meal moths, notes, (44) Kans. 249.

Meal moths, rearing, (46) 456.

Mealie meal, analysis, (45) 775.

Mealy flatas, notes, (47) Conn.State 156.

Mealybug—*see also* special hosts.

Baker's, control, Calif. (47) 653; (48) 551.

Baker's, on cedar in Florida, (49) 354.

citrophilus, control, (47) U.S.D.A. 158.

citrus, control, (41) 664; (43) 557,

659; (48) U.S.D.A. 458, U.S.D.A. 854.

citrus, notes, (41) 166, 354, 756, 757; (42) 546; (47) 255.

citrus, summary, (50) Mich. 454.

Hibiscus, campaign against, (47) 657.

new, on citrus trees, (45) 860.

on cacao, (47) 255.

on mulberry, (47) 255.

on sugar cane, (48) 854.

Mealybugs—

- biological control, (48) 152; (50) 661.
- control, (47) 657; (48) Hawaii 355; (49) 448.

on house plants, summary, (50) Mich. 454.

on roots and nodules of legumes, (49) 655.

paper on, (48) 852.

prevention in vineyards, (46) 658.

relation to mottling disease, (44) 159.

shelters constructed by Argentine ants for, (47) 55.

studies, (41) 756.

sulphur fumigation for, (42) 649.

summary, (49) 452.

Measures used in agriculture in Brazil, conversion into metric system, (49) 392.

Meat—*see also* Beef, Pork, etc.

analysis from different cuts, (49) N. Mex. 869.

analysis, official method, (44) 9.

and bone meal, analyses, (41) Ind. 564, 868.

and bone meal, digestibility coefficients, (48) 574.

and bone scrap, analyses, (42) 263, Mass. 866; (43) 867; (44) Mass. 671; (45) N.Y.State 469; (47) Mass. 274, 275.

and bone scrap and meal, analyses, (47) N.Y.State 172.

and meat products, international trade, (41) U.S.D.A. 892.

and milk in food supply, (44) 258.

blowflies on, protection against, (46) 57.

butchering and curing in China, (46) 764.

canned, bacteriology, (42) 163; (48) 754.

canned, examination, (42) 862.

canned, inspection in England, (44) 360.

canned, international trade, (46) 675.

canning, cold pack method outfits, (43) 808.

chemistry, (43) 609.

chilled and frozen, black spot in, (46) 860.

cold storage, molds in, (47) 560; (48) 258; (50) 763.

consumption in United States, (48) U.S.D.A. 68.

curing and preservation, (42) 616; (45) 260.

curing, sugar substitutes for, (44) U.S.D.A. 557.

determination of nitrites in, (42) 711.

dried, antiscorbutic properties, (42) 760.

drying, (41) 362, 557, 807.

drying, vacuum process, (42) 507.

effect on blood regeneration, (44) 565.

effect on carbon dioxid-combining power of blood plasma, (47) 64.

Meat—Continued.

effect on physical efficiency, (47) 461.
 estimation in sausages and meat
 pastes, (41) 713, 714.
 extracts, analyses, (46) 12.
 extracts, artificial, levulinic acid in,
 (46) 416.

feeding of pigeons, studies, (49) 359.
 foreign trade in, (48) U.S.D.A. 69.

frozen—

autolysis, (49) 11.
 British trade in, (47) 275.
 cooking, (44) 61.
 industry of New Zealand, (42)
 867.

international trade, (46) 675.
 statistics, (42) 867.

trade in Australia and New Zea-
 land, (49) 168.

vitality of tapeworm in, (50) 582.

hygiene, textbook, (41) 81.

industry—

American, treatise, (50) 167.
 in southern Brazil, (41) 671.
 in Victoria, further development,
 (42) 593.
 of Great Britain, (50) 168.
 of world, treatise, (50) 670.

inspection—

and handling in England and
 Wales, (47) 283.

discussion, (47) 483.

Federal, (42) 379; (43) 780.

guide, (42) 378; (44) 678.

in Canada, (42) 379.

in Norway, (41) 280; (50) 582.

in Saxony, (44) 476; (46) 479.

laws, (45) 881.

regulations governing, (49)
 U.S.D.A. 782.

treatise, (44) 475.

investigations, review of, (42) 363.

juice, antiscorbutic value, (43) 263.

killing, cutting, and curing, (49) 570.

kosher, trade in New York City, (45)
 U.S.D.A. 89.

legislation in South Africa, (42) 459.

market reports, (41) U.S.D.A. 672.

meal, analyses, (47) 69.

meal, effect on egg production, (45)
 71.

meals for hogs, (41) Iowa 272.

methods of investigation and standards,
 (41) 558.

packers' encyclopedia, (49) 370.

packing and cold storage interests in
 Great Britain, (49) U.S.D.A. 892.

packing houses, treatise, (46) 491.

packing industry, effect of agricultural
 depression, (47) 296.

poisoning, relation to disease, (42) 273.

poisoning, toxic agent, (41) 668, 808.

powder, dried, (41) 362.

preservation, (41) 263, 415.

preservation by freezing, (49) 559.

prices in France, (42) 287.

prices, July, 1920, (43) U.S.D.A. 695.

Meat—Continued.

production—

biotechnology, (42) 263.

fattening and growth, (43) 371,
 372.

in Brazil, (43) 292.

inheritance of, (44) 267.

relation to needs of Great Britain,
 (49) U.S.D.A. 892.

products, determination of water in,
 (41) 799; (43) 415.

products, jellied, bacteriology of, (42)
 254.

proteins, separation, (48) 802.

ring, farmers', organization and man-
 agement, (47) 374.

scrap—

analyses, (41) N.H. 68, Ind. 564,
 Ind. 868, N.Y.State 868; (42)

Mich. 63, 263, 560, Ind. 769,
 Tex. 769, Mass. 866; (43) N.J.

69, Ind. 69, Ky. 373, N.J.
 672, Ind. 867; (44) 267, Mich.

568, Mass. 671; (45) Tex. 68,
 N.Y.State 469, N.J. 775, 872;

(46) Mich. 168, N.H. 675, Tex.
 675; (47) Mass. 274, Ind. 473;

(48) 68, Me. 68.

and meal, analyses, (47) N.Y.
 State 172.

as corn supplement for chicks, (42)
 670.

as source of protein for egg pro-
 duction, (47) Idaho 870.

digestibility coefficients, (48) 574.

estimation of bone in, (50) Mich.
 715.

feeding value, (49) 273.

for egg production, (41) Ind. 571;
 (46) Ky. 875; (48) Ky. 172.

for pullets, (46) Ind. 574.

phosphoric acid standard, (41)
 564.

v. milk products for laying hens,
 (48) Calif. 573.

spoilage, (41) 808.

spoilage, detection, (45) 13; (46) 753.

storage and shipping space, saving,
 (41) 672.

storage holdings, (41) U.S.D.A. 558.

substitutes, use for food, (47) 612.

whale, composition and digestibility,
 (42) Calif. 861.

zinc content, (42) 758.

Mecas inornata, notes, (45) 159.

Mechanical testing, treatise, (48) 589; (49)
 887.

Mechanics, analytical, treatise, (49) 284.

Mechanics, farm, treatise, (49) 284.

Media, *see* Culture media.

Medic, pods, digestion coefficients, (42) 263.

Medicago falcata, culture in Alaska, (41)
 Alaska 31.

Medical chemistry, treatise, (43) 609.

Medicinal—*see also* Drug plants.

substances, substitutes in Germany,
 (43) 204.

Medicine—

- and surgery, industrial, (43) 564.
- biological standards and application, (47) 482.
- patent, notes, (43) N.Dak. 368.
- physiology and biochemistry in, (45) 578.
- tropical, laboratory studies, (42) 174.
- tropical, manual, (44) 179.
- tropical, studies, (50) 783.
- value of chemical research to, (47) 501.

Medicines—

- chemical nature, (50) 880.
 - chemistry and analysis, treatise, (45) 207.
 - proprietary, analyses, (44) N.Dak. 360.
- Medick, spotted, characteristics and distribution in England, (48) 441.

Medlar—

- fruits, discomycete on, (49) 250.
- Japanese, brusone in, remedy, (43) 349.
- leaf spot, (46) 44.
- stoneless, origin, (41) 446.

Megachile bicolor, gynandromorphism in. (47) 358.

Megalomerothrips, new genus, erection, (41) 847.

Megalonectria caespitosa, notes, (50) 143.

Megalopyge opercularis—

- causing dermatitis, (48) 357.
- effect of sting on man, (50) 258.

Megapodius nicobariensis, races of, (42) 847.

Megasse, alcohol and paper pulp from, (47) 113.

Megasse, fertilizing value, (49) 122.

Megastigmus spermatrophus, notes, (48) 59.

Megilla maculata, notes, (42) 252.

Megninia gallinulae, notes, (46) 885.

Meibomia (Desmodium), agricultural value, (49) 34.

Meibomia leiocarpa as forage crop for Cuba, (41) 829.

Meigenia floralis, notes, (41) 59.

Melampsora—

- lini, notes, (45) 649; (46) 743; (48) 46.

pinitorqua, studies, (41) 659.

sp. on willow, (43) 350.

spp., culture experiments in Japan, (44) 55.

tremulae, notes, (44) 347.

Melampsorae, studies, (41) 353.

Melampsoridium betulinum, notes, (44) 347.

Melampsoropsis piperiana, description, (45) 547.

Melanconis spp., notes, (48) 850.

Melanconium—

- sacchari, notes, (43) 152; (45) 443; (46) 45.

sacchari on sugar cane, (43) La. 348.

sp. on butternut, (41) 752.

Melanin, chemical nature, (49) 575.

Melanin, differentiation from other pigments, (45) 64.

Melanitis ismene, on rice, (42) 451; (46) 458.

Melanitis leda, notes, (42) 751.

Melanophila spp., biological notes, (41) 166.

Melanoplus—see also Grasshoppers.

atlantis, migration, (47) 360.

differentialis, control, (41) Ariz. 355.

differentialis, notes, (42) Ariz. 357.

spp., life history, habits, and control, (50) Colo. 52.

spp., notes, (46) 153; (47) N.Y. Cornell 848.

spp., poison baits, (41) 252.

Melanopsammopsis ulei n.g., description, (45) 654.

Melanopsammopsis ulei, notes, (41) 841.

Melanorrhoa usitata oleo-resin, (41) 345.

Melanose, studies, (49) Fla. 838.

Melanosis and Melanosarcoma, differentiation, (43) 683.

Melanostoma species, notes, (47) 853.

Melanotus hyslopi n.sp., notes, (46) 461.

Melaphis minutus n.sp. from moss, (41) 255.

Melezitose—

crystallography and occurrence in honey, (42) 311.

fermentation products, (48) 108.

in honey-dew honeys, (41) 799.

Meliana albilinea limitata, life history and control, (43) 54.

Meligethes aeneus, studies, (44) 57; (45) 655; (49) 252.

Melinda cognata, life history, (42) 454.

Meliola—

arundinis, notes, (46) 45.

bicornis, notes, (46) 845.

palmarum, notes, (47) 547.

sp., notes, (49) 45.

Melissobates gularis on stored peanuts, (42) 453.

Melissodes, pollination by, (47) 857.

Melitara junctolineella, seasonal adaptation in southern hemisphere, (50) 558.

Melitensis-abortus group, nomenclature, (50) 183.

Melittia satyriniformis, see Squash borer.

Melittobia acasta—

life history, (48) 556.

notes, (50) 360.

parasite of flies, (42) 362.

Mellessis spp., descriptions, (43) 57.

Meloe sp., notes, (46) U.S.D.A. 158.

Melolontha—

spp., summary, (45) 756.

vulgaris, biology, (47) 655.

vulgaris larvae, destruction, (50) 457.

Melolonthidae, notes, (45) 658.

Melon—

aphid—

biology and natural enemies, (48) 253.

Melon—Continued.

aphid—continued.

control, (43) 451; (46) 852; (47) Ohio 850; (48) U.S.D.A. 457; (49) Wis. 653.

in New Jersey (41) N.J. 255.

in South Dakota, (43) 850.

life history studies, (43) Tex. 758.

nicotin sulphate dust for, (44) U.S.D.A. 652.

beetles, notes, (41) N.C. 660; (48) Mo. 650.

caterpillar, notes, (45) V.I. 150.

diseases, notes, (43) 151.

downy mildew, notes, (48) Mass. 643.

fly, control, (43) 455.

fly in Hawaii, control, (41) Hawaii 146; (44) 660; (45) 657.

fusarirose, studies, (47) 46.

mosaic, notes, (49) Iowa 746.

shipments, (43) U.S.D.A. 695.

Melons—

breeding experiments, (42) 38.

culture experiments, (44) P.R. 442; (48) V.I. 340.

disease resistant varieties, (43) Md. 144.

fertilizer experiments, (47) Ill. 830.

insects affecting, Mo. (43) 757; (45) 252.

project study outlines, (44) 596.

Melophagus ovinus, *see* Sheep tick.

Melting point determination, (42) 503.

Melting point determination, apparatus, (43) 12.

Membracidae of South Dakota, (47) 848.

Membranaria, new genus, erection, (45) 255.

Men, drafted from rural and urban districts, defects in, (44) 490.

Mendelian—

and biometric theories, (42) 559.

characters, effect of alcohol, (42) 766.

characters, multiple allelomorphs, (42) 764.

characters of plants, studies, (44) 428.

characters, theoretical distribution, (41) 267, 268, 473.

class frequencies, probable error, (42) 63.

inheritance and geographic variation, (44) 866.

population, fluctuations of sampling in, (41) 867.

ratio, effect of selection, (49) 769.

ratios in species with few offspring, (44) 668.

splitting and chemical equilibrium, (44) 726.

theory, Darwinian statement of, (42) 821.

theory, exposition and critique, (41) 726.

Mendelism, progress, (45) 122.

Meningitis—

cerebro-spinal, in the horse, (41) 280, 480, 784.

tuberculous, bovine infection in, (45) 481.

Meningococcus as affected by vitamins in animal tissue, (41) 574.

Meningo-encephalitis—

enzootic, etiology, (42) 571; (44) 280; (45) 888.

epizootic, etiology, (46) 485.

epizootic, immunization, (45) 686.

epizootic, of horses, (44) 482.

in domestic animals, (47) 80.

of horses, studies, (48) 679.

Menispora microspora on chestnut, (47) 541.

Menopon pallidum, control, (45) Mont. 586.

Menstrual cycle and basal metabolism, (50) 460.

Menus—*see also* Diet.

for hotel employees, (42) 458.

Mercurform for bean seed treatment, (49) 841.

Mercurial ointment, insecticidal value, (44) U.S.D.A. 162.

Mercurialis annua, inheritance in, (44) 218, 219, 220.

Mercuric acetate, oxidation of creatin by, (41) 668.

Mercuric chlorid—*see also* Corrosive sublimate.

as milk preservative, (42) 173.

germicidal value, (44) 680.

solution, reduction in strength, (45) 651.

Mercuric cyanid for potato seed treatment, (47) Mich. 149.

Mercurophen—

as a disinfectant, (41) 283.

toxicity of, (42) 880.

Mercurous chlorid, effects on culicid larvae, (47) 357.

Mercury—

as insecticide, (45) 657.

compound, new, with powerful germicidal properties, (50) 284.

compounds, effect on tuberculosis, (45) 581.

density of, (41) 808.

metallic, as insecticide, (48) 749.

vapor quartz lamp irradiation, effects, (46) 869; (47) 567; (50) 265.

Meria laricis, notes, (44) 347; (46) 554.

Meridarchis scyroides, notes, (49) 849.

Merk grass, culture in Florida, (41) Fla. 37.

Mermis myrmecophila n.sp., description, (46) 752.

Merodon equestris, studies, (50) 156, 452.

Meromyza americana, studies, S.Dak. (44) 652; (47) 451; (49) 549.

Merrillia, new genus of the Citreae, (41) 432.

Merulius—

- in North America, notes, (42) 147.
- lacrymans, notes, (43) 350; (44) Conn.State 149.
- spp. in North America, key, (42) 726.
- spp., studies, (44) 27.

Mesaporus calandrae, notes, (41) 759.

Mesembrina sp., overwintering, (48) 157.

Mesembrinella Giglio-Tos, notes, (48) 855.

Mesembryanthemum, gas interchange, (41) 28.

Mesochorus pallidus, bionomics of, (43) 457.

Mesoleius—

- balteatus n.sp., description, (42) 655.
- gymnonychi n.sp., description, (43) 857.

Mesophyll secretion by evergreen foliage, (42) 433.

Mesquite—

- analyses, (48) 416.
- bean, famine fodder for Karoo, (49) 265.
- beans, chemical and structural study, (50) U.S.D.A. 501.
- climax formations, (41) 634.
- wood, borers attacking, (45) U.S.D.A. 258.

Mess management, manual, (42) 658.

Mesta of shepherds, history, (46) 390.

Metabolic laboratory, hospital, (41) 68.

Metabolism—

- and endocrinology, treatise, (48) 162.
- and respiratory quotient during rest and work, (44) 463.

as affected by—

- nature of rations, (43) S.Dak. 874, Va. 875.

phlorizin, (41) 68.

rate of cooling, (41) 365, 563.

secretin, (43) 369.

bacterial, studies, (48) 107; (49) 609, 610.

basal—

- and menstrual cycle, (50) 460.
- apparatus for measuring, (44) 264; (45) 66; (46) 671.
- clinical measurement, (46) 260.
- determination, difficulties, (46) 861.
- determination from carbon dioxide elimination, (46) 672.
- determination, method, (45) 66.
- discussion, (48) 859.
- during vitamin B starvation, (50) 63.
- effect of colloidal iron, (46) 356.
- of boys, (45) 863.
- of children, (45) 561.
- of children, standards, (46) 261.
- of girls, (49) 457.
- of infants, (42) 168.
- of infants fed on dry milk powder, (46) 756.
- of man, (41) 760.

Metabolism—Continued.

basal—continued.

- of poultry during vitamin starvation and polyneuritis, (47) N.Y. State 465.

of school children, (49) 763.

of swine, effect of temperature, (48) 872.

of underweight children, (47) 63.

of underweight women, (48) 160.

of women, (46) 166.

rate determination, (45) 670.

relation to thyroid activity and pulse rate, (46) 861.

standards for, (47) 165; (49) 57.

summary of data, (49) 57.

symposium, (46) 260.

calcium—

and magnesium, of women, (48) 861.

and phosphorus, of oats-fed horses, (44) 672.

effect of dry v. fresh plant tissue, (44) 667.

effect of vitamins, (49) 58.

carbohydrate, *see* Carbohydrate metabolism.

cellular, of polyneuritic pigeons, (49) 766.

chlorid, (44) 465.

crate for calves and small ruminants, (49) 164.

effect of—

cooling power of atmosphere, (47) 665.

lactic acid on, (42) 259.

ultra-violet light, (46) 870.

vitamins, (47) 265.

work and heat on urine, (42) 554.

endogenous purin, effect of diet, (46) 757.

experiments—

improved procedure, (50) 367.

on fat-free diet, (46) 255.

on vitamin-free diets, (44) 861.

role of cellulose fermentation in, (46) 69, 70.

with ruminants, (48) 871; (50) 573.

fat, relation to accessory substance, (41) 559.

fat, studies, (47) 366.

gaseous, of castrated rabbits, (44) 266.

gaseous, of various tissues, (47) 767.

in China, (49) 660.

in pellagra, (45) 668.

inorganic, studies, (48) 755, 861; (50) 570.

mineral, of cows, (41) 372; (47) 76, 278, 873; (48) Ohio 375.

mineral, relation to acid-base equilibrium, (50) 664.

mineral, relation to protein requirement, (41) 558.

nitrogen, in cows, (47) 77.

Metabolism—Continued.

- nitrogen, in plants, (47) 109.
 - of a dwarf, (43) 368.
 - of a fasting hog, (48) 475.
 - of actinomycetes, (43) 634, 635.
 - of cattle, (44) 68.
 - of children, (43) 166.
 - of children undergoing open air treatment, (47) 665.
 - of diabetes, (47) 370.
 - of fowls, (46) 172.
 - of fungi, (48) 825.
 - of guinea pigs, effect of alteration, (45) 766.
 - of infants with severe malnutrition, (46) 762.
 - of man, effect of aluminum compounds on, (42) 165.
 - of man in Switzerland, (47) 666.
 - of negroes in Tropics, (46) 671.
 - of pigeons, effect of polished rice diet, (46) 470.
 - of pigeons on vitamin B deficient diet, (48) 467.
 - of plants, (47) Minn. 348.
 - of roots, (45) 221; (46) Mo. 323.
 - of sulphur, (47) 167.
 - of very obese child, (44) 566.
 - of white race in Tropics, (42) 554; (46) 671.
 - of women, increase due to muscular work, (42) 167.
 - of women workers, (41) 761, 856.
 - on vitamin-free diet, (49) 459.
 - per calorie of technical work, (41) 563.
 - phosphorus and calcium, of milch cows, (41) 678.
 - phosphorus requirement, (42) 554.
 - plant, carbon-nitrogen ratio, (43) 430.
 - plant, temperature effects in, (50) 20.
 - protein, in chicks, (42) 671.
 - protein, of Filipinos, (41) 563.
 - protein, studies, (41) 171.
 - respiratory, as affected by spleen, (44) 264.
 - respiratory, during undernutrition, (43) 859.
 - resting and during exercise, (47) 665.
 - rôle of vitamins in, (42) 460.
- Metal flumes, design and life, (47) 388, 389.
- Metaleurodicus manni n.sp., description, (50) 155.
- Metallic salts, effect on—
- bacteriological analysis of water, (49) 285.
 - nitrogen fixation, (49) 18.
- Metals—
- action on milk, (47) 281.
 - and metalloids in human body, (45) 665.

Metals—Continued.

- bactericidal effect on tetanus, (44) 780.
 - in food, analysis, official method, (44) 9.
 - in food, colorimetric determination, (50) 613.
 - injury from boring insects, (48) U.S. D.A. 555.
 - of cooking utensils, solubility, (50) 763.
 - poisonous, on sprayed fruits, (47) U.S.D.A. 360.
 - precipitation, use of kelpchar in, (47) 411.
 - suitable for kitchen utensils, (43) 65.
 - toxicity, (47) 242.
- Metamasius mosieri n.sp., description, (43) 562.
- Metamasius sericeus, notes, (45) V.I. 150.
- "Metaphen," properties, (50) 284.
- Metarrhizium anisopliae—
- notes, (49) Nebr. 659.
 - parasitism by, (46) 560.
 - pleophagy of, (43) 858.
- Metasphaeria spp., notes, (47) 547.
- Metastrongylus spp., notes, (49) 80.
- Meteorological—
- and climatological bibliography of Argentina, (50) 208.
 - conditions, importance in potato diseases, (49) 752.
 - conditions, relation to plant diseases, (47) 43.
 - corrections on gun ranges, (42) U.S. D.A. 620.
 - course at Camp Alfred Vail, (45) U.S.D.A. 17.
 - instrument shelters, shading, (43) U.S.D.A. 718.
 - instruments—
 - discrepancies, (43) U.S.D.A. 511.
 - for determining temperature, (43) U.S.D.A. 237.
 - wiring instructions, (50) U.S. D.A. 716.
 - literature, bibliography, (48) 614.
 - literature, classification, (41) U.S.D.A. 121.
 - notes, (49) U.S.D.A. 827.
 - observations—*see also* Climate, Rain-fall, Weather, *etc.*
 - at Belle Fourche Experiment Farm, (42) U.S.D.A. 322.
 - at East Lansing, Michigan, (46) 419.
 - at Hettinger, (41) N.Dak. 809.
 - at Requena, (50) 316.
 - at San Antonio, (47) U.S.D.A. 415.
 - at Santo Domingo, (43) 17.
 - at Wisley, (43) 207.
 - effect of temperature discrepancies, (42) N.Y.State 316.

Meteorological—Continued.

observations—continued.

- in Alaska, Alaska (41) 17; (44) 314, 508; (47) 511; (49) 413.
- in Assam, (49) 15.
- in Australia, (43) 208; (46) 131.
- in Brazil, (47) 210.
- in British Isles, book of normals, (42) 715.
- in Canada, (42) 118; (43) Can. 798; (44) 416; (49) Can. 809.
- in Connecticut, Conn.Storrs (43) 120; (44) 122.
- in England and Wales, (50) 316.
- in France, (43) 17; (46) 314.
- in Great Britain, (43) 621.
- in Guam, Guam (42) 14; (45) 17; (46) 711; (49) 413.
- in Havana, (42) 715.
- in Iowa, (42) 419.
- in Kentucky, Ky. (43) 318, 810; (46) 809; (48) 115; (49) 509.
- in Maine, Me. (41) 17; (44) 122, 195; (45) 418; (48) 417, 498; (50) 13.
- in Massachusetts, Mass. (41) 17, 315, 509, 808; (42) 322, 715; (43) 207, 511, 719; (44) 122, 416, 810; (45) 113, 322, 617; (46) 209, 419, 809; (47) 210, 415, 617; (48) 115, 417, 716; (49) 208, 509, 719; (50) 116, 510, 809.
- in Michigan, (45) 210.
- in Minnesota, Minn. (42) 731, 809; (43) 811; (44) 315; (47) 317; (48) 315.
- in Montana, Mont. (42) 419; (44) 315; (46) 314, 830.
- in New Jersey, N.J. (44) 315; (46) 510; (48) 316.
- in New South Wales, (41) 509; (44) 810; (46) 209.
- in New York, N.Y.State (45) 113; (46) 618.
- in New Zealand, (41) 718.
- in North Dakota, N.Dak. (44) 17, 508; (45) 210; (48) 209.
- in Ohio, Ohio (42) 510; (45) 113; (46) 510; (48) 509.
- in Oklahoma, Okla. (43) 16; (45) 418.
- in Pennsylvania, Pa. (43) 511; (44) 717.
- in Philippines, (41) 718; (47) 210; (48) 510.
- in Scotland, (42) 510.
- in South Australia, (43) 811.
- in Sweden, (41) 809; (43) 621.
- in Texas, Tex. (42) 809; (43) 17, 229.
- in Trinidad and Tobago, (46) 711.
- in Tunis, (48) 614; (49) 16.
- in Uganda, (44) 811.

Meteorological—Continued.

observations—continued.

- in United States, U.S.D.A. (41) 120, 121, 417, 418, 509, 716, 808; (42) 12, 117, 321, 619, 620; (43) 119, 120, 318, 418, 510, 511, 718, 810; (44) 16, 121, 122, 195, 314, 415, 416, 618, 714, 716, 717; (45) 17, 321, 322, 418, 512, 617, 722, 808; (46) 16, 115, 209, 419, 618, 808; (47) 17, 316, 317, 414, 415, 616, 720; (48) 114, 209, 297, 315, 509, 716; (49) 207, 412, 413, 508, 615, 718, 809; (50) 115, 116, 415, 510, 808.
 - in Virgin Islands, (48) V.I. 316.
 - in Virginia, (42) Va. 420.
 - in Washington, (47) West.Wash. 510.
 - in Wyoming, Wyo. (41) 315; (43) 120; (45) 418; (47) 116, 196; (49) 413.
 - of bombing pilot in France, (43) U.S.D.A. 511.
 - value in fumigation, (43) 319.
 - phenomena as affected by lunar phases, (43) 417.
 - phenomena, relation to variations in solar activity, (43) 810.
 - records at Bozeman, (49) Mont. 116.
 - records for 1918, (44) N.Y.State 17.
 - records for 1922, (50) Mont. 116.
 - service, British, use to farmers, (50) 207.
 - service, marine, (42) U.S.D.A. 13.
 - service of Brazil, (50) 13.
 - stations, distribution, (44) U.S.D.A. 717.
 - tables, (48) 209.
 - tables, Smithsonian, (41) 808.
- Meteorology—see also Climate, Rainfall, Weather, etc.
- agricultural, (46) 208.
 - agricultural, development, (50) 13.
 - agricultural, field for investigation, (49) 807.
 - agricultural, new service, (48) 314.
 - agricultural, treatise, (44) 507.
 - and agriculture, (42) 716; (43) U.S. D.A. 718; (45) 417; (48) 208.
 - Antarctic, value to agriculture, (43) 418.
 - applied, in California, (45) U.S.D.A. 319.
 - applied, in Italy, (46) 15.
 - Brazilian division, (46) 599.
 - development, (50) 808.
 - effect on leaf coloration and fall, (50) 324.
 - introductory, textbook, (41) 15.
 - manual, (43) 208; (46) 711.
 - of temperate zone and atmospheric circulation, (45) U.S.D.A. 17.
 - papers on, (41) 716; (49) 614.

Meteorology—Continued.

- papers on, U.S.D.A. (41) 120, 418, 716; (42) 13, 321, 620; (43) 15, 119, 511, 718; (44) 121, 415, 716; (45) 17, 321, 722; (46) 115, 618; (47) 17, 316, 414, 617; (48) 114, 509, 716; (49) 207, 508, 509, 718; (50) 115, 415, 808.
- simplified, treatise, (50) 314.
- status and problems, (44) 616.
- treatise, (50) 313.

Meteorus—

- dimidiatus, parasitism by, (46) 247.
- revision of genus and new species, (49) 855.
- versicolor, parasitism by, (46) 457.

Meter for measuring irrigation water, (42) 480.

Meters for irrigation and drainage ditches, (44) 283.

Methane, effect on catalase production, (42) 708.

Methane formation in septic tanks, (44) 188.

Methoxyl products from wood distillation, (48) 416; (50) 206.

Methyl alcohol—

- as nutrition for algae, (46) 824.
- detection, (42) 613; (43) 614; (50) 803.
- detection in presence of ethyl alcohol, (45) 805; (46) 505; (50) 804.
- determination, (44) 11, 412.
- in Gottlieb-Roese test, (41) 311.
- production from alkali-sawdust fusion, (41) 314.
- substitute for grain alcohol, (47) 13.
- U.S.P. test for, (41) 715.

Methyl anthranilate—

- detection in fruit juices, (45) 207.
- in grape beverages and flavors, (50) 204.
- in grape juice, (46) 207; (48) 413.

Methyl orange—

- examination, (44) 9.
- substitutes for, (42) 504.

Methyl red, use as indicator, (42) 611.

Methylene blue—

- absorption by cotton, (50) 413.
- reduction test, (42) 472; (43) 271; (44) 676; (48) 275.
- toxic effect, (44) 76.
- use against abortion, (50) Vt. 381.
- use in determination of reducing sugars, (49) 310.
- use in staining milk, (47) 79.

α -Methylglucosid, utilization by *Aspergillus niger*, (43) 203.

Methylguanidin, occurrence in meat, (41) 668.

Meyer Memorial Medal, notes, (43) 400.

Miami Conservancy District, contract forms and specifications, (45) 388.

Miami flood-control project, hydraulics of, (45) 388.

Mica—

- minerals, source of potassium for plants, (50) 521.
- use as potassic fertilizer, (49) 817.
- use as solid lubricant, (49) 888.

Mice—

- age and chemical development, (50) 569.
- albino series, fourth allelomorph in, (48) 566.
- artificial infection with insect flagellates, (45) 387.
- as enemies of man, (43) 250.
- breeding experiments, (41) 866.
- caging and feeding, method, (47) 60.
- color mutation in, (46) 268.
- entozoa of, (43) 457.
- exhibition standards, (43) 575.
- field, spermatogenesis, (45) 771.
- girdling of apple trees by, (43) Conn. State 237.
- homozygous yellow, fate of, (42) 763.
- inheritance of cancer in, (47) 865.
- inheritance of color, (42) 763; (44) 866.
- injurious to fruit trees, prevention, (44) Mich. 157.
- intravenous administration, (45) 478.
- linkage in, (42) 762; (43) 669; (46) 268.
- meadow, control in Italy, (43) 250.
- microorganisms in lungs of, (48) 278.
- protection of fruit trees from, (43) Ohio 340.
- sex-linked lethal factor in, (44) 67.
- short-eared mutants, (46) 268.
- spotted, breeding experiments, (44) 362.
- susceptibility to infection with *Bacillus abortus*, (48) 581.
- susceptibility to strychnin, (46) 655.

Michigan—

- College, notes, (41) 798; (45) 400, 498, 900; (46) 299, 699; (47) 99, 399, 699; (48) 99, 697, 898; (49) 99, 196, 397, 799, 899; (50) 599, 697.
- department of agriculture, laws, (48) 892.
- Station, available bulletins, (44) 195.
- Station; notes, (45) 400, 900; (46) 699; (47) 99; (48) 99, 600, 697, 898; (49) 99, 196, 899.
- Station, quarterly bulletin, (41) 98, 397, 598; (42) 397, 694; (43) 698; (44) 195, 598; (45) 497, 698, 899; (46) 598; (47) 196, 697, 898; (48) 396; (49) 97, 495, 898; (50) 496.
- Station, report, (41) 698; (45) 297; (46) 498; (48) 298.
- Upper Peninsula Substation, report, (47) 196.

Micracis, North American, key, (46) Miss. 461.

Micracisoides, new subgenus, erection, (46) Miss. 461.

- Microbabesia divergens*, in Netherlands Indies, synonymy, (42) 570.
- Microbiology—**
 of foods, treatise, (45) 462.
 of soil, (46) 513.
 textbook, (44) 576; (45) 578.
- Microbracon—**
 cephi, parasitism by, (43) U.S.D.A. 260.
 lefroyi, oviposition and life history, (47) 358.
 meromyza, notes, S.Dak. (44) 652; (47) 451; (49) 549.
 n.spp., description, (48) 59.
 sp., notes, (44) U.S.D.A. 163.
- Microcerotermis dolichognathus*, notes, (48) 252.
- Microchemistry of plants**, treatise, (47) 9.
- Micrococcus—**
 acididica n.sp. description, (48) 154.
 caprinus, notes, (43) Mich. 688.
 catarrhalis, notes, (49) 682.
 from bronchopneumonia of swine, (44) 378.
 infection of chicks, (45) 79.
 melitensis—*see also* *Bacillus melitensis* and *Bacterium melitensis*.
 and *Bacillus abortus*, relationship, (48) 481; (49) 881.
 populi, notes, (43) 552; (45) 550.
 pyogenes albus, notes, (49) Ky. 581.
 sp., stainability, (44) 675.
 spp., notes, (50) U.S.D.A. 258.
 tetragenus, notes, (46) Mass. 81.
- Microcolorimeter and nephelometer**, (44) 711.
- Microcolorimeter**, new, description, (46) 805.
- Microgaster connexus*, bionomics of, (43) 457.
- Microlepidoptera—**
 Central American, new, (45) 255.
 Indian, (45) 658.
 life histories, (45) 661.
- Micromus posticus*, life history, (50) 558.
- Micromus vinaceus*, notes, (45) 551; (47) 253.
- Microorganism—**
 Gram-negative, of avian diphtheria, (50) 285.
 thermophilic, isolated from canned corn and beans, (44) 62.
- Microorganisms—see also** *Bacteria and Organisms*.
 affecting cotton fibers, (49) 646.
 as food supply for insects, (43) 51.
 attenuated, agglutinability of, (43) 581.
 autotrophic, oxidizing selenium, (49) 23.
 classification in regard to agglutination and immunity, (44) 876.
 enzymes of, bibliographic review, (48) 675.
 growth in, (46) 127.
 growth-promoting substance in, (48) 162.
- Microorganisms—Continued.**
 heat resistant, in canned peas, (43) Mich. 114.
 in lungs of animals, (48) 278.
 in soil—
 effect of fertilization on, (48) 816.
 effect of green manure, (48) 120.
 mathematical interpretation, (48) 119.
 methods of study, (48) 719.
 plate method for determining, (48) 212.
 relation to crop growth, (49) 514.
 variability, (48) 320.
 in sulphur cycle of soil, (47) 621.
 in tomato products, (48) N.Y.State 610.
 optimum pH values, (48) 312.
 oxidation of sulphur by, (46) 822; (47) 27.
 oxidation of zinc sulphid by, (49) 18.
 pathogenic, textbook, (42) 774; (45) 578.
 rôle in plant chemistry, (42) 514.
 saprophytic and pathogenic, (44) 342.
 vitamin in, relation to culture medium, (47) 167.
- Microphthalma* spp., parasites of white grubs, (42) 549.
- Microphthirus*, new genus, (43) 453.
- Micropipette holder, description, (50) 612.
- Micropsylla*, new genus, notes, (50) 359.
- Micropterus*, synonymy, (42) 751.
- Microsaccharimeter*, description, (42) 211.
- Microscope, uses in the mill, (47) 108.
- Microscopes*, damp chamber for, description, (48) 29.
- Microscopic preparations*, mounting of, (42) 229.
- Microscopy*, elementary chemical, (46) 201.
- Microscopy*, laboratory manual, (46) 201.
- Microsomes* in plant cells, (50) 23.
- Microsphaera—**
 alni, notes, (45) 851; (49) 446.
 grossulariae, notes, (43) 246; (44) 346.
 quercina, notes, (43) 754; (44) 347, 651.
 sp., notes, (47) 541.
- Microsporidia*, new species, (47) 256.
- Microsporidia* parasitic in mosquitoes, (48) 156.
- Microterys* spp., notes, (43) 252.
- Microtypus dioryctriae* n.sp., description, (43) 857.
- Middleman a necessity, (42) 289.
- Middlings—see also** *Wheat, Oat, Rye, etc.*
 analyses, (41) N.H. 68; (42) Mich. 63, 560, 769, Mass. 866; (43) Ind. 69, Ky. 373, Ind. 867; (44) 267, Mass. 671; (46) Can. 167.
 and palm oil, analyses, (42) 263; (45) N.J. 775.
 and shorts, analyses, (44) Mass. 671.
 feeding value, (41) Mich. 74.
 offal content, (43) 314.
 standards for, (49) 65.
 with screenings, analyses, Mich. (42) 63; (44) 568; (46) 168.

Milax gagates, studies, (44) Oreg. 158.
 Mildew—*see also host plants*.
 control, (44) 151.
 downy—
 nontoxicity of copper for, (45) 49.
 notes, (44) Conn.State 149.
 on apple, (46) 646.
 on grape, (46) 453, 745, 849.
 on seed corn, treatment, (49) 750.
 on spinach, (46) 45.
 on tobacco, control, U.S.D.A. (45) 247, 248.
 toxicity of copper to, (48) 148, 456.
 epidemic of 1921, (49) 445.
 false, transmission by seed, (43) 549.
 hops resistant to, (45) 543.
 on cereals, notes, (46) 239.
 powdery—
 control, (41) 751; (50) 346.
 experiments, conclusions, (43) 549.
 notes, (42) 648.
 on apple, (46) 144, 453.
 on fruit trees, (47) 44.
 on swedes, (48) 146.
 studies, (41) Mo. 654.
 proofing of canvas, (41) 551.
 resistance of fabrics, testing for, (42) 508.
 Mildews—
 coccinellid attacking, (45) 257.
 effect on photosynthesis, (44) 518.
 Milk—
 abnormal—
 analyses, (47) 784.
 detection, (42) 209; (43) N.Y. State 579; (44) 575; (47) 611; (49) 677.
 studies, (48) 176.
 toxic properties, (42) 875.
 acidity, (47) 582.
 acidity—
 as affected by rations, (45) 175.
 determination, (42) 208.
 development, (44) 371.
 effect on alcohol test, (49) 717.
 relation to coagulation temperature, (44) 13.
 acidophilus, therapeutic value, (50) 161.
 actinomyces in, effect, (48) 275.
 action of churning on, (47) 711.
 action of, in utilization of proteins, (44) 175.
 action of metals on, (47) 281.
 active chlorin as germicide for, (50) 679.
 added water in, determination, (41) 799, 804, 805; (42) 209, 315; (47) 716; (49) 612, 805.
 adulterated, detection, (41) 208.
 adulteration with coconut milk, (42) 112.
 advertising methods, (43) U.S.D.A. 580.
 agar, standards, (47) 280.

Milk—Continued.
 agglutinins in, source, (49) 280.
 alcohol test for, (45) U.S.D.A. 276.
 altered, analysis, (48) 807.
 altered, determining extent of, (43) 14.
 altered, lactose determination, (43) 505.
 amino acids in, (47) 201.
 amylase in, (45) 679.
 analyses—
 application of theory of probability, (47) 409.
 in China, (43) 177.
 in Egypt, (42) 269.
 in Java, (42) 112.
 physicochemical, (49) 716.
 analysis and utilization, treatise, (44) 178.
 analysis, sources of error, (43) 415.
 and disease, (46) 879.
 and distillery residues, feeding value, (50) 266.
 and fat production of breeds, (49) 174.
 and hemolysis, (45) 207.
 and its uses, U.S.D.A. (46) 60; (50) 58.
 and legume seed proteins, supplementary value, (46) 161.
 and meat in food supply, (44) 258.
 and milk products, methods and costs of selling, (49) 677.
 and orange juice, antiscorbutic action, (47) 61.
 and oranges, value in school lunches, (50) 563.
 and vegetables, relative value as calcium source, (48) 463.
 antiscorbutic—
 value, (41) 266, 470; (42) 162, 760; (47) 267.
 value, as affected by diet of cow, (43) 766.
 vitamin, destruction by alkalization, (42) 256.
 artificial, preparation, (42) 660.
 as a galactagogue, (41) 80.
 as affected by—
 bacteria from bedding material, (44) 74.
 cod liver oil feeding, (49) 780.
 fish meal feeding, (49) Fla. 874.
 gestation and stage of lactation, (41) 679.
 vitamins in dairy ration, (47) 281.
 as disease carrier, (48) 577; (49) 176.
 as sole ration for calves, (48) 772.
 as source of vitamins, (43) 165; (48) 259.
 as supplementary meal for undernourished children, (50) 855.
 Ayrshire, studies, (42) 69.
 bacteria—
 alkali-forming, (41) U.S.D.A. 374.
 as affected by clarification, (41) Mass. 278.

Milk—Continued.

bacteria—continued.

- in, (42) 72, S.C. 447, 472; (46) S.C. 771; (47) 79; (48) S.C. 672; (49) 277.
- in, and cream as affected by agitation, (47) Calif. 676.
- in, comparative plate counts, (48) 672.
- in, determining, (44) 575; (48) 275.
- in, effect of dirt, (46) Ill. 373, 772; (47) Ill. 482.
- in, little plate method of counting, (45) 175; (46) 175.
- in, post-pasteurization count, (44) 205, 675.
- in, reductase test for, (49) 612.
- in, relation to cheese ripening, (45) N.Y.State 476.
- in, relation to pH, (45) 175; (47) Calif. 676, 877.
- in, relation to temperature, (50) 876.
- in, source, (44) 371.
- in, variation in, (46) N.Y.Cornell 274.
- lactose-fermenting, (41) 888.
- bacterial—
 - analysis, (41) 372, 373, 573, 679, 776; (46) 174; (47) 280.
 - analysis, methods, (42) 472; (43) 379, Pa. 579; (49) 275; (50) 877.
 - analysis, pin point colonies in, (50) 877.
 - contamination, (43) 679; (45) 175.
 - count, factors affecting, (41) 374, 375; (50) 876.
 - count in, value, (46) 176.
 - count, methods, (47) N.Y.State 178, 783.
 - counts, accuracy, (43) N.Y.State 680; (45) 476.
 - counts, irregularities, (49) 760.
 - counts, Skar method, (49) 376.
- bacteriological control, (43) 379.
- bacteriological tests in Dublin, (46) 75.
- beverages, preparation, (42) U.S.D.A. 363.
- biological changes in, determination, (46) Mich. 479.
- biological properties, treatise, (42) 564.
- biology of, (45) 276.
- biorized, bacteriological studies, (43) 877.
- bitter, cause, (49) 74.
- boiled, curd of, (41) 468.
- boiled, effect on scurvy, (46) 360.
- bottled, fly pupae in, (42) 173.
- bottled, pasteurization, (45) Okla. 476.
- bottles—
 - Babcock test, calibrating, (50) 413, 714.

Milk—Continued.

bottles—continued.

- bacteria on rims, (43) 680.
- brown glass, studies, (46) Iowa 76.
- glass, manufacture, (46) 76.
- improperly capped, danger, (47) 877.
- losses, (42) U.S.D.A. 673.
- sterilization, (42) 876; (50) 877.
- bottling, labor used in, U.S.D.A. (44) 574; (45) 174.
- buffaloes', analyses, (42) 363, 771; (46) 577.
- buffaloes', differentiation from cows', (42) 210.
- buffaloes', food value, (42) 363.
- buffaloes', use in India, (41) 680, 777.
- calcium and inorganic phosphorus in, (50) 609.
- calcium in, effect on cheese making, (50) 378.
- calcium in, relation to casein digestion, (46) 863.
- calcium phosphate in, effect of heat, (46) 802.
- cans, effect of steam on germs, (49) 277.
- cans, empty, cleanliness, (46) 75.
- cans, steaming, effect on bacteria, (47) 582.
- cans, sterilization, (46) 76.
- cans, washing, (41) 373, 774, 775.
- carbon dioxid content, (44) N.Y.State 74.
- carbonated, bacteria in, (47) Ill. 180.
- carbonic acid and carbonates in, (43) N.Y.State 579.
- care before pasteurization, (48) 276.
- catalase content, determination, (45) 315.
- cellular count, relation to udder infections, (41) Mich. 578.
- certified, *Drosophila* in, (41) 57.
- certified, production, (47) 280; (49) 176.
- characters, variation and inheritance, (49) 474.
- chemistry, (41) 201; (43) 609.
- chlorin in, (47) 367.
- chlorin in after ingestion of salt, (46) 174.
- chocolate, examination and evaluation, (49) 204.
- citric acid in, (41) 804; (46) 615.
- clarification for cheese making, (49) N.Y.Cornell 475.
- clarification, studies, (41) Mass. 278; (44) 179; (45) 380.
- clean, aids in production of, (49) 175.
- clean, for small towns, (50) 877.
- clean, production, (43) Ky. 877; (48) 877.
- clean, production, manual, (43) 679.
- clean, production, premiums for, (50) 877.
- coagulated, analysis, (50) 805.

Milk—Continued.

coagulation—

- by acid, (49) 804.
- cause, (44) Wis. 274.
- during sterilization, (49) 73.
- effect of carbohydrates, (44) 258.
- in alcohol test, factors affecting, (49) 716.
- in the stomach, (41) 467.
- studies, (42) 208.
- temperatures, (44) 13.
- colloid chemistry of, (41) 310.
- colon-aerogenes organisms in, (42) 72; (44) 272.

composition—

- and freezing point, (47) Conn. State 505.
- as affected by stage of lactation, (43) 272.
- as affected by udder inflammation, (48) 176.
- calculating from cheese analysis, (41) 805.
- changes due to feeding, (47) 166.
- changes in, (48) Mo. 671.
- during foot-and-mouth disease, (47) 282.
- factors affecting, (41) Mo. 677, 679; (43) Mo. 778; (45) Mo. 276.
- in British East Africa, (46) 273.
- variations in, (42) 875; (43) 74, 578; (47) 876.

condensed—

- abnormal, (42) Iowa 173.
- adulteration, (48) 773.
- analyses, (42) Conn.State 254.
- and dried, methods of production, (49) 679.
- antiscorbutic value, (41) 470; (45) 870.
- "buttons" in, (43) 779.
- manufacture and prices, (44) 274.
- monograph, (45) 862; (46) 258.
- preparation, (41) 81.
- prices, (42) 473; (43) U.S.D.A. 595.
- production and international trade, (41) U.S.D.A. 892.
- production during the war, (41) 473.
- solids in, determination, (50) 202.
- sweetened and unsweetened, (50) 378.
- sweetened, formation of gas in, (43) Iowa 76.
- sweetened, viscosity, (44) 677.
- treatise, (44) 373.
- world's trade, (45) U.S.D.A. 294.
- yeasts and molds in, (48) 577.

conditions in Iowa, (49) 277.

conservation and analysis with added dichromate, (45) 315.

consumption, (45) 174.

consumption, campaign to promote, (48) 773.

Milk—Continued.

- consumption in United States, (41) 774.
- contamination from milking machines, N.Y.State (47) 180, 481.
- contamination with *Bacillus enteritidis* sporogenes, (45) U.S.D.A. 73.
- contests, (42) U.S.D.A. 377.
- contests, city, (49) 277.
- control in dairy plants, (46) 75.
- control, municipal, (42) 673.
- control, organization, (46) 174.
- control, organization and administration, (49) 277.
- cooling, (49) 175, 698; (50) 875.
- cooling on the farm, (42) Mich. 397.
- cooperative delivery, (42) 673.
- copper in, solubility, (50) 178.
- cost of production, (41) Ohio 274, Mo. 694; (42) 70, Mich. 377, Minn. 874; (43) Mich. 378; (44) N.J. 370, Mich. 573, Mich. 574; (45) U.S.D.A. 275, 777, Iowa 778, U.S.D.A. 879; (46) 771; (47) Wis. 480, Wash.Col. 594; (48) 388, Wash.Col. 591, Mo. 686; (49) Wash.Col. 291.
- cost of production—
 - accounting system, (42) 673.
 - and distribution in New York State, (42) 772.
 - around Montreal, (42) 269.
 - as affected by use of legume hay, (44) 370.
 - effects of the war, (49) 793.
 - in Detroit, (43) 178.
 - in France, (50) 191.
 - in Illinois, (41) 573; 677; (44) 89.
 - in Indiana, (43) U.S.D.A. 678.
 - in Maryland, (42) 773.
 - in Minnesota, (45) 778.
 - in New England, (42) 172.
 - in North Carolina, (43) N.C. 469, 678.
 - in Ontario, (44) 691; (48) 592.
 - in Rochester, New York, (43) 271.
 - in Scotland, (48) 592; (50) 191.
 - in Vermont, (44) U.S.D.A. 774.
 - in Washington, (44) U.S.D.A. 473.
 - in Wisconsin, (49) U.S.D.A. 88.
 - seasonal, (42) Ill. 563.
- cream volume, measurement, (46) Ill. 578.
- creaming, (47) 314.
- creaming ability, effect of pasteurization, (46) Ill. 578.
- cryoscopy, (45) 506; (47) 314; (49) 275; (50) Conn.State 172, Conn. State 160.
- cultures, volatile acidity, (43) 61, Iowa 75.
- curds, modification for infants, (47) 166.
- daily allowance for calcium storage in children, (48) 463.

Milk—Continued.

- dealers and inspectors, relations, (47) 280.
- decomposed after heating, toxic properties, (42) 875.
- dehydration, (41) 557.
- deproteinization, methods, (46) 564.
- detection in breadstuffs, (49) 611.
- determination of H-ion concentration, (49) N.Y.Cornell 712.
- determination of phosphoric acid in, (49) 805.
- dialyzed, for infant feeding, (41) 859.
- diet, effect on skeleton, (50) 361.
- diet of cats, metabolic disturbances from, (48) 867.
- diets, (43) Conn.Storrs 767.
- distributing plants, cooperative, (48) U.S.D.A. 189.
- distribution—
 - costs in Kingston, New York, (44) 574.
 - in cities, (42) 773; (43) 178, 681, Mich. 698; (47) Mich. 281.
 - in New Jersey, (46) 75.
 - of salts in, (46) 205.
 - reforms in, (46) 694.
- dried—
 - analyses, (46) 863.
 - antiscorbutic value, (41) 266; (45) 869.
 - for infant feeding, (49) 700.
 - notes, (46) 276.
 - nutritive value and effect on milk supply, (47) 60.
- effect of corrosive sublimate as a preservative, (42) 173.
- effect of heat and oxidation, (45) 666.
- effect of unsterile utensils on, (49) 475.
- effect on smooth muscle, (41) 858.
- electrical conductivity, (41) 804; (42) 875.
- electrically treated, vitamin content, (42) 875.
- electrometric titration, (41) N.Y.State 201.
- enzymes, relation to abnormal fermentations, (47) 314.
- enzymes, relation to abnormal flavors, (43) Mo. 712.
- evaporated—
 - bitterness in, (44) 777.
 - coagulation temperature, (45) 111.
 - relation of acidity to coagulation temperature, (46) 803.
 - solids in, determination, (50) 202.
 - spoilage in, (47) Wis. 481.
 - sterilizing, (46) 681.
- ewes', analyses, (49) 175.
- ewes', change during lactation, (47) 79.
- ewes', quantity and composition, (41) 176.
- examination, (41) 372, 373, 573, 679, 776, 804, 805; (42) 315, 472; (46) 75, 113.

Milk—Continued.

- examination, Gram staining, (45) 779.
- fat—*see also* Fat.
 - adulteration, determining, (46) Ind. 205.
 - and solids in, effect of lactation period, (46) 680.
- fat as affected by—
 - coconut meal feed, (46) Calif. 577.
 - cottonseed meal feeding, (46) Iowa 371; (47) 278.
 - drugs, (47) 278.
 - plane of nutrition of cow, (47) 783.
 - rations, (43) Va. 875.
 - rice polish, (44) 573.
 - temperature, (47) 380.
- fat—
 - Babcock test, (41) Iowa 279; (43) 75; (49) Ky. 276.
 - casein as protective agent, (49) 805.
 - composition, as affected by poppy seed cake, (43) 777.
 - content at different periods of lactation, (50) Can. 781.
 - content, inheritance, (49) 877.
 - content, relation to acidity, (50) 875.
 - content, seasonable variation, (46) 679.
 - cost of production, (46) 90, 679.
 - determination, Babcock method, modified, (44) N.Y.Cornell 873.
 - determination in butter, (49) 113.
 - determination in margarin, (41) 412.
 - determination, methods, (43) 578; (45) 277; (50) 806.
 - determination of turbidity point, (48) 611.
 - effect on calcium assimilation, (48) 756.
 - effect on magnesium and phosphorus assimilation, (48) 861.
 - fatty acid content, (49) 678.
 - measurements, optimum temperature for Hortvet bottle, (44) 312.
 - of buffalo and cow, variations, (47) 582.
 - of cows on official test, (46) Mo. 371.
 - of dried milk, (47) 112.
 - origin, (46) 878.
 - percentage and quantity, (48) Mo. 671.
 - percentage and yields, relation, Ill. (50) 75, 676.
 - percentage, effect of temperature, (49) 73.
 - percentage, factors affecting, (50) 475.
 - percentage increased by feed, (46) 679.

Milk—Continued.

fat—continued.

- percentage of different lactations, (44) Me. 272; (48) 478; (50) 178.
- percentage, seasonal variations, (49) 73, 677.
- percentage, variation with age, (44) 178, 271, Me. 271, 675; (50) Me. 74.
- percentages and production of Friesian cows, correlation coefficient, (49) 677.
- percentages and yields of different tests, relation, (49) Me. 174.
- prices and grain prices, (44) 872.
- production, comparative value of foods, (50) 579.
- production, feed cost of, (49) Ill. 576.
- production increase, relation to weight, (50) 578.
- quality as affected by velvet bean meal, (49) Fla. 875.
- relation to other nutrients, (48) 175.
- relation to solids-not-fat, (41) 372.
- relation to water content of cheese, (44) 75.
- table for computing, (47) 282.
- test of cream, factors affecting, (50) Ind. 178.
- test, 2-day official, factors affecting, (50) 178.
- tests, comparison, (43) N.Y.Cornell 469.
- transmission in cross-bred cattle, (45) 475.
- v. cod liver oil, antirachitic value, (46) 471, 472.
- Valenta test and Crismer number, (41) 805.
- variation, stage of lactation as factor, (48) 78.
- vitamin A in, (44) 560.
- feed cost of, (49) Ill. 576.
- feeding value, (50) Wash.Col. 277.
- fermented, bacterial growths in, (45) 380.
- fermented, effect on intestinal flora, (43) Conn.Storrs 767.
- filled, (47) 280.
- flavor and odor, effect of feed, U.S. D.A. (50) 376, 377.
- flavor and odor, effect of silage, (48) U.S.D.A. 79.
- flow, summer, maintaining, (48) 876.
- flow, winter, maintaining, (42) Wash. 694.
- food value, (41) Ill. 65; (42) 462, 659, Conn.State 659; (46) 174; (47) 280, Wis. 464; (48) 773; (49) 176, 277, 364, Okla. 459, 699.
- for health campaigns, education, (49) U.S.D.A. 494.

Milk—Continued.

- for infant feeding, methods of modifying, (45) 260.
- for intestinal disorders, (45) Mich. 698.
- formulas, (50) 278.
- formulas, mineral elements in, (46) 862.
- fresh, acidity, (44) 73.
- fresh, bactericidal properties, (47) 177.
- fresh, specific gravity, (49) 275.
- freshly drawn, cause of variation in reaction, (43) N.Y.State 578.
- from different breeds, cream rising power, (49) 781.
- from different quarters of udder, (47) 381; (48) 479.
- from Norrbotten, composition, (49) 73.
- from pellagrous mothers, composition, (43) 668.
- from Polish Red cows and Whitebacks, comparison, (49) 175.
- from udder infected with foot-and-mouth disease, (43) 877.
- fruity flavors in, (45) 779.
- garlic flavor in, removing, (48) 176, 233.
- germicide action in, (45) 72.
- goat's—
 - acidity, (45) 175.
 - analyses, (44) Calif. 778.
 - analyses and skimming, (47) Calif. 676.
 - and cow's, composition, (50) 266.
 - and cow's, viscosity determination, (44) 503.
 - and ewe's, analyses, (50) 875.
 - chlorin content, (47) 367.
 - dairy products from, (44) 776.
 - detection in cow's milk, (48) 111.
 - Egyptian, analyses, (42) 269.
 - nonprotein nitrogen in, (49) 175.
 - protein in, (42) Calif. 875.
 - size of fat globules in, (45) 175.
 - vitamin C in, (49) Ohio 259.
 - zinc content, (42) 758.
- grade "A," bacterial count, (46) 176; (48) 276.
- grade "A," bacteriological standard for, (48) 79.
- grade "A," keeping qualities, (47) 380; (48) 276.
- grading, (41) 775; (42) U.S.D.A. 377; Mich. 613.
- grading at Rouen, (43) 271.
- grading by acid test, (45) 175.
- grading, composite sample, necessity of, (44) 272.
- grading, rapid acidity test, (45) 507; (46) 205.
- growth-promoting properties, (46) 60.
- handling, improvement, (49) 475.
- handling in city milk plants, (41) 775.
- handling in ventilated and unventilated churns, (42) 773.

Milk—Continued.

- heat coagulation theory, (49) 716.
- heated, temperature of surface, (47) Calif. 676.
- heat-treated, deficiency in, (44) 860; (45) 863.
- high quality, rejected by laboratory tests, (49) Wis. 677.
- house, adobe, construction, (45) Ariz. 791.
- house, experimental, (42) Calif. 894.
- houses, construction and equipment, (42) Nebr. 285, 489.
- houses, diagrams, (49) 175.
- houses, plans and construction, (46) U.S.D.A. 288.
- human—
 - action of churning on, (47) 711.
 - analyses, Conn.State (43) 859; (50) 160.
 - and cows', casein in, (46) 261.
 - artificial substitute for, (42) 660.
 - bacteriological studies, (47) 463.
 - chlorids in, (45) 764.
 - composition, (41) 615, 802.
 - effect on smooth muscle, (41) 858.
 - excretion of foreign protein in, (49) 361.
 - fat content, (49) 275.
 - food proteins in, (46) 564.
 - in organic constituents, racial variations, (50) 562.
 - inorganic phosphate in, relation to rickets, (47) 770.
 - zinc in, (41) 464; (45) 64.
- hygiene, textbook, (41) 80.
- hypochlorites and chloramins in, detection, (48) U.S.D.A. 12.
- importance in diet, (44) U.S.D.A. 168; (47) 363.
- imports and exports, (43) 74.
- improvement, policies and methods, (49) 276.
- improvement through college extension work, (47) 280, 675.
- in Ceylon, analyses, (48) 274.
- in diet, effect on growth, (48) 160.
- in Japan, laws governing sale, (50) 876.
- in milk chocolate, (49) 204.
- industry in Scotland, (46) 679.
- infection with *Streptococcus epidemicus*, (42) 568.
- inheritance of quantity and quality, (42) 771.
- inspection, (41) 372, 573, 775, 776; (47) Conn.State 559; (49) 275.
- inspection in Chicago, (42) 673.
- inspector, relation to milk plant manager, (49) 277.
- inspectors, manual for, (48) 274.
- international trade, (46) 675.
- intolerance of infants for, treatment, (42) 363, 660.
- investigations and standards, (41) 558.
- investigations, review of, (42) 863.

Milk—Continued.

- iron in, effect on formalin reaction, (45) 718.
- isolation of *Bacterium abortus* from, (44) Mich. 879.
- keeping in water coolers, (44) Calif. 777.
- keeping quality as affected by hydrogen peroxid, (47) 676.
- keeping quality, judging, (42) 209; (43) N.Y.State 579, 615, Mich. 681; (44) 675; (45) Mich. 678; (46) 175; (49) N.H. 311.
- lactic acid, as infant food, (44) 64; (50) 856.
- lactose in, determination, (43) 805; (45) 12, 13; (50) 714.
- laws and regulations, (41) 372, 373.
- laws from 1916 to 1919, (49) 377.
- laws in Massachusetts, (42) 673; (46) 75.
- laws in Scotland, (49) 377.
- laws in South Africa, (42) 459.
- leaving in udder before test, effect, (50) Pa. 474.
- lime content as affected by smoke polluted pastures, (44) 431.
- lipase detection in, (47) 109.
- machine and hand drawn, (47) 280.
- malting, analyses, (42) Conn.State 254.
- malting, fat in, (47) 314.
- manurial pollution, detection, (45) 73; (47) 877.
- market—
 - Producing in Delaware, (48) U.S. D.A. 291.
 - regulations for control, (44) 179.
 - standardization, (44) N.Y.State 95.
 - treatise, (48) 577.
- marketing, (41) 183, 184; (42) Wis. 391; (43) 178, 580, 681, Mich. 698; (47) 281.
- marketing—
 - costs in Columbus, Ohio, (45) U.S.D.A. 294.
 - in six cities, (50) Kans. 593.
 - papers on, (49) 277.
 - treatise, (45) 577.
- media, phenol red, preparation, (47) 803.
- methylene blue reduction test for, (42) 472; (43) 271.
- mineral constituents, (50) 161.
- neutralization for cheese making, (45) 778.
- neutralizers in, detection, (44) 12.
- new score card for, (45) 277.
- nitrogen determination in, (49) 111.
- nonprotein nitrogenous constituents, (41) 616, 802.
- nutritive—
 - efficiency for adults, (44) 560.
 - properties and reproductive failure in rats, (49) 663.
 - value as affected by feed, (45) 165.
 - value for white mice, (46) 566.

Milk—Continued.

- of aborting cows, agglutinins and amboceptors in, (47) 185.
- of Danish cows, composition, (50) 781.
- off-flavors produced in, (50) 878.
- ordinance, types, (48) 877; (49) 175; (50) 876.
- oxidation of xanthin and hypoxanthin by, (48) 207.
- pasteurization, (41) 184, 775; (44) 872; (46) 174; (49) 276, 699; (50) 580, 878.
- pasteurization—
 - conference on, (50) 782.
 - control in Chicago, (43) 877.
 - effect on creaming ability, (46) Ill. 578.
 - electrical, (42) 875; (43) 778.
 - final package v. vat method, (42) Iowa 173.
 - for cheese making, (50) 679.
 - in glass enameled tank or bottle, (50) S.Dak. 75.
 - laboratory supervision, (48) 79.
 - new method, tests, (42) 565.
 - papers on, (47) 280.
 - systems, (42) U.S.D.A. 673.
 - test, (44) 777.
- pasteurized—
 - antiscorbutic value, (41) 266.
 - cellular test for, (42) 173.
 - coagulation in the stomach, (41) 468.
 - colon-aerogenes in, (44) 272.
 - cream layer, relation to temperature, (49) 276.
 - decomposition of hydrogen peroxid in, (43) 206; (44) 205.
 - detection, (48) 207.
 - high counts in, (50) 878.
 - hydrogen peroxid in, detection, (42) 505.
 - increased bacterial count, (42) 72.
- pasteurizing—
 - machines, types, (47) 281.
 - temperature effect on paratyphoid group, (45) 380; (46) 275.
- pathological, determination, (47) 716.
- paying on quality basis, (50) Mich. 475.
- payment according to butter-fat content, (48) 773.
- percentage of acidity neutralized, (44) 13.
- peroxidase in, determination, (41) 616; (47) 505.
- pH effect on growth of lactic acid bacteria, (44) 272.
- phosphates, determination, methods, (47) 611.
- plant—
 - city, at Jamestown, New York, (43) 878.
 - city, construction and arrangement, (43) U.S.D.A. 682.
 - cooperative, (43) 682; (44) U.S.

Milk—Continued.

- plant—continued.
 - equipment, (44) U.S.D.A. 179.
 - erecting, (50) 876.
 - inspectors, qualifications, (46) 175.
 - machinery, efficiency, (49) 277.
 - modern, structure and equipment, (49) 276.
- plants—
 - bacterial control in, (46) 175.
 - operation, (49) U.S.D.A. 377.
 - test for locating improper pasteurization or contamination, (50) Mich. 278.
- powder—
 - analyses, (42) Conn.State 254; (47) 876.
 - antiscorbutic value, (41) 470; (45) 767; (47) 267.
 - apparatus for making, (46) 11.
 - bacterial content, (49) 75.
 - dry, use in infant feeding, (46) 756, 863.
 - fat analysis, (47) 112.
 - for infant feeding, (43) 566; (48) 757.
 - keeping qualities, (44) Calif. 778; (50) Minn. 179.
 - manufacture and prices, (44) 274.
 - moisture content, (48) 611.
 - preparation, (41) 81.
 - structure, (49) 75.
 - treatise, (44) 373.
 - value, (47) 280.
 - vitamins in, (46) 61; (47) 365.
- preparations, analyses, (42) 162.
- preservation for chemical analysis, (42) Mo. 207.
- preservation with corrosive sublimate, (42) 173.
- preservation with potassium dichromate, effect on tubercle bacilli, (47) 184.
- preservative, use of mustard oil as, (45) 111.
- preserved by potassium dichromate, analysis, (42) 112.
- preserved, lactose determination in, (41) 505.
- price fixing, (41) 193, 573, 574.
- price of protein in, (41) 677.
- prices—
 - determination at Evansville, (43) 878.
 - in Chicago, (42) 673.
 - in New Jersey, (46) 75.
 - in 1919, (43) U.S.D.A. 178.
 - reducing in New York City, (44) 574.
 - relation to distribution, (43) 877.
 - relation to fat content, (43) 178.
 - statistics, (43) 74.
 - treatise, (44) 89.
- problem in hot climates, (46) 879.

Milk—Continued.

Producers' Association of America, Certified, proceedings, (49) 175.
Producers' Association, Twin City, (43) 878.

production—

and butter-fat percentages, of Friesian cows, correlation coefficient, (49) 677.
and consumption, (47) 280.
and cows, treatise, (50) 577.
and dairy products in New York State, (49) 177.
and distribution in Great Britain, (41) 184; (42) 672.
and distribution in New South Wales, (49) 475.
and other characters, correlation, (47) 278.
and trade, (49) 376.

production as affected by—

dipping cows, (44) 776.
drugs, (41) 181; (49) Iowa 779.
feed, (45) 174; (47) 279, 378, 478, Calif. 674.
green feed, (44) 776.
silage feeding, (49) Pa. 472.
Sudan grass pasture, (49) Kans. 472.
urea, (48) 376, 671.

production—

bacteriological control, (48) 275.
biotechnology, (42) 263.
clean, (42) U.S.D.A. 598; (44) 74; (45) Ariz. 777.
clean, manual, (44) 872.
corn v. sunflower silage for, (49) Idaho 778.
cost of manual labor in, (48) 78.
cottonseed meal and peanut feed for, (41) Tex. 78.
during heat period, (46) Ky. 372.
economics, relation to composition of rations, (49) N.Y.Cornell 577.

production, effect of—

age, (48) Iowa 668.
age and pregnancy, (46) Ky. 372.
age and stage of lactation, (49) 173.
breeding, (45) 173, 174; (43) Iowa 371.
delayed breeding, (48) 874.
drugs on, (43) 577.
fertilization of pastures, (47) 816.
pregnancy, (48) 874.
protein rations, (48) Vt. 174.

production—

factors affecting, (42) 70; (49) 875.
feed consumed in, (41) N.Y.Cornell 180.
feeding standards for, (47) Va. 476.
in Canada, (45) 879.
in China, (42) 771; (50) 875.

Milk—Continued.

production—continued.

in Dutch East Indies, (47) 582.
in Ireland, (45) 72.
in New York State, statistics, (42) 771.
in 1921, (47) U.S.D.A. 493.
inheritance of, (44) 267; (45) Me. 677.
of individual cows, (49) 174.
of young cows, (46) 74.
pasture crops for, (49) Idaho 778.
proteins for, (43) 270; (45) 71.
ration for, (49) Fla. 875.
relation of labor to, (46) 175.
relation to body secretions, (46) Ky. 373.
seasonal variations in, (49) 677.
significance of balance in, (49) 875.
soybean v. alfalfa hay for, (50) W.Va. 73.
statistics, (43) 74.
studies, (50) Ky. 873.
summer, maintenance, (46) Iowa 370.
summer, silage v. soiling crops for, (47) Iowa 78.
sunflower v. corn silage for, (45) Wash. 275; (48) Wyo. 769.
tests of roughages for, (49) Iowa 578.
unsanitary, in England, (46) 879.
variation in costs, (48) Wis. 292.
winter and summer, economics of, (49) 173.
winter, rations for, (49) 874.
with low bacterial count, (50) 781.
yearly, effect of time of calving, (47) 78.

products—

citric acid content, (46) 615.
in America and Europe, (43) 74.
inspection and analysis, (45) Conn.State 365.
solids in, comparison of cost, (49) 376.
v. meat scrap for laying hens, (48) Calif. 573.

project study outlines, (44) 596.

properties as affected by heat, (50) Pa. 411.

protein for infants, (44) 64.

protein free, distribution of sulphur in, (50) 710.

protein modifications for pigs, (50) Iowa 172.

proteins—

anaphylaxis reactions, (46) 9.
biological value, (47) 765.
in, (42) Calif. 875; (49) 802.
methods of precipitation, (42) 416.
price of, (41) 677.
relation to amino acids of blood, (46) 74.

Milk—Continued.

- quality and adulteration, (50) 278.
- quality, methylene blue test, (47) Wis. 481.
- ration for calves, addition of hay and grain to, (50) 275.
- raw and pasteurized, decomposition of proteins, (45) 260.
- reaction in relation to blood cells and bacterial infections, (43) 578; (44) N.Y.State 473.
- recording, (48) 274; (50) 278.
- recording—
 - in England, (47) 380.
 - in Scotland, (45) 379.
 - societies, value, (46) 679.
 - societies, value of food records in, (46) 879.
- records—
 - analyses, (43) Me. 174.
 - examination, (48) 78.
 - in Scotland, (46) 679.
 - methods of keeping, (48) 478.
 - of Ayrshire cows, analysis, (43) 74.
 - of Jersey cows, (43) 777.
- reductase reaction, effect of ultra-violet light, (45) 718.
- refrigeration on southern farms, (41) 374.
- refrigerator, homemade, (44) 88.
- relation to infant feeding, (42) 564.
- relation to public health, (47) 164.
- remade, (42) 674; (46) 176, 177; (49) 699.
- remade, distinguishing, (49) 277.
- remade, properties, (47) 110, 111, 280; (48) 81.
- removing onion flavor from, (47) N.C. 580.
- rennet coagulability, effect of heat, (46) 802.
- retention of, (43) 876.
- ropy, (44) 676; (46) 175; (50) Ohio 580.
- ropy, acidity of, (44) 273.
- ropy, cause, (43) Ill. 579; (44) 75, 676.
- sale in Scotland, testimony regarding regulations, (49) 475.
- salt content, as affected by feed, (45) 165.
- samples, examination, (50) 878.
- samples, preservation, (41) 573; (44) 204.
- samples, table for sorting, (41) 804.
- sampling, methods, (42) 472.
- sanitary control, (41) 774, 775, 776; (44) 73.
- score card, Government, (47) 280.
- score card, new, (42) U.S.D.A. 377.
- score card, standard, (48) 577.
- secretion—*see also* Milk production.
 - and milk flow, (49) 173.
 - calcium and phosphorus as limiting factors, (47) 279.
 - effect of edestin, (47) 365.

Milk—Continued.

- secretion—continued.
 - effect of gestation, (50) 278.
 - effect of hypophysin and adrenalin, (48) 265.
 - effect of milk injection, (41) 80; (47) 675.
 - effect of nucleoproteins of udder, (42) 672.
 - effect of pituitrin injection, (41) 79.
 - effect of proteins, (46) 65; (47) 62, 858, 859.
 - effect of underfeeding, (50) 177.
 - of a doe kid, (41) 79.
 - phosphorus and calcium metabolism in, (41) 678.
 - physiology and cause of holding back milk, (47) 676.
 - physiology of, (49) 173.
 - rate of decline in lactation period, (49) 375.
 - relation to diet, (46) 878.
 - relation to growth and senescence, (50) 578.
 - studies, (49) 677; (50) 178, 277, 278.
 - studies, Me. (43) 175; (44) 178, 271, 675; (46) 173; (47) 176; (48) 478; (49) 174; (50) 74.
 - variation with age, (43) 676, Me. 677.
- sediment tests, (41) 775.
- serum proteins, (49) 802.
- serving in schools, (47) 280; (49) 277, 700.
- shops, regulations governing in England, (50) 279.
- sickness and trembles, relation, (48) 676.
- sickness of livestock, (45) U.S.D.A. 783; (49) Ind. 580.
- skimmed, *see* Skim milk.
- smears, staining, (46) 431.
- sodium chlorid in, (49) 311.
- solids in, determination, (50) 202.
- solids-not-fat in, determination, (49) 677.
- sour—
 - aroma organisms in, (44) 179.
 - effect on aluminum vessels, (42) 377.
 - effect on urinary acidity, (48) 163.
 - fat determination in, (45) 207.
 - feeding value, (48) Mo. 666.
 - lactic acid in, (41) N.Y.State 201.
 - remedy for poultry diseases, (42) Calif. 887.
 - skim, for chicks, (43) N.C. 468.
 - streptococci in, (45) 276.
 - substitutes for control of coccidiosis, (44) Calif. 779.
- souring, as affected by bacterial growth, (43) N.Y.State 681.
- souring, streptococci of, (50) 279.
- spoiling, (46) 771.

Milk—Continued.

- spray process of drying, effect on vitamin C in, (50) 564.
- staining by the Breed method, (47) 79.
- stations, cooperative, (41) 184.
- streptococci in, (42) 773, 878; (44) Pa. 776.
- substitute for calves, (42) 271; (43) Ind. 875; (44) 776, 871; (46) Mo. 371; (47) Wash. 173, 278; (48) Mo. 669; (49) U.S.D.A. 875.
- successive portions, variation in fat per cent, (46) 771.
- sugar determination in, (45) 111.
- sugar, formation in mammary gland, (44) 872.
- supplies, inspection, (49) U.S.D.A. 878.
- supply—
- and public health, (46) 281.
 - city, improving, (47) 280, Mich. 281.
 - city, in Canada, (43) 877.
 - city problems, (47) 783.
 - city, standards, (49) 277.
 - control, (41) 193, 372, 373, N.Y. State 373, 775, 776; (43) 778; (48) 79.
 - effect of dry milk industry, (47) 61.
 - of Calcutta, (43) 177.
 - of Chicago, (47) 783.
 - of China, sanitary aspects, (43) 177.
 - of Detroit, (43) Mich. 178.
 - of District of Columbia, (43) 877.
 - of Edinburgh, (45) 380.
 - of Ireland, (43) 74.
 - of Kansas City, (48) 773.
 - of London, papers on, (49) 277.
 - of New Haven, improving, (50) 876.
 - of New York, (41) 372.
 - of New York City, (42) 772.
 - of Rouen, (44) 370.
 - of small town, control, (41) 373.
 - of various cities, (46) 174.
 - relation to bovine diseases, (49) 277.
- surplus, statistics, (42) U.S.D.A. 773.
- surplus, utilization, (49) 277.
- survey at Rochester, (43) 270.
- survey of Kansas cities, (48) 274.
- synthetic adapted, for infant feeding, (42) 660.
- temperatures and bacterial content, (49) 698; (50) 876.
- test classes at Salisbury, (47) 380.
- tester, tests, (47) Wis. 481.
- testing, (46) Calif. 578; (48) S.Dak. 78, 275.
- testing—
- apparatus for calibrating Babcock test bottle, (44) 805.
 - Babcock, *see* Babcock test.
 - for freshness, (41) 311.
 - in schools, (44) 295.
 - on fat basis, (44) N.J. 474.

Milk—Continued.

- tests, daily variations in, (43) 778.
- tests, effect of preliminary dry milking, (47) 783.
- transportation, (41) 372; (49) 699; (50) 876.
- transportation—
- and handling, (49) 277.
 - and marketing, (46) 174; (47) 280.
 - in metal tanks, (49) 276.
 - rates and methods, (50) 581.
- treatise, (49) 175.
- tryptophan content, (45) 311.
- types of, (44) 74.
- urea in, (49) 205.
- utensils—
- clean, importance of, (41) 774, 775.
 - sterilization, (41) 372; (46) 175.
- value and care, educating public concerning, (49) 699.
- value for chicks, (45) N.J. 378.
- viscosity, relation to creaming, (50) Minn. 179.
- vitamin A—
- in, (46) 357, 680; (48) 862.
 - in, increasing, (49) 780.
 - value of, (50) 567.
- vitamin B in, (45) 567.
- vitamin B in, as affected by ration of cow, (49) Wis. 666.
- vitamin C in, as affected by feed, (45) 165.
- vitamins—
- in, (45) 867; (47) Wis. 464, 861; (49) 176; (50) Minn. 175, 857.
 - in, effect of autoclaving, (50) 62.
 - in, effect of diet of cow, (47) 78.
 - in, effect of formaldehyde, (49) 459.
 - in, from cows on vitamin-free rations, (46) Kans. 478.
- whole, feeding value, (44) Pa. 770.
- whole, skimmed, and filled, vitamin A in, (49) Wis. 664.
- yield and butter-fat percentages of different tests, relation, (49) Me. 174.
- yield, correlation of lactations, (44) Me. 271.
- yield, effect of—
- age of cow, (44) Me. 675.
 - calcium and phosphorus in feed, (45) U.S.D.A. 274.
 - cassava feeding, (43) 73.
 - poppy seed cake, (43) 777.
 - transfer from pasture to stall, (44) 73.
- yield—
- inheritance, (48) 398; (49) 877.
 - of different lactations, relation, (48) 478; (49) 677.
 - relation to conformation of cows (44) Me. 178.
 - transmission in crossbred cattle, (45) 475.

Milk—Continued.

yield—continued.

value of 7-day test, (44) Me. 178.

variations with age and lactation period, (50) 580.

zinc content, (41) 464; (42) 758.

Milking—

machine experiments, (49) S.Dak. 579.

machine v. hand, (41) Mich. 373.

machine v. hand, costs, (48) Ill. 671.

machines—

and clean milk, (42) 773.

care, (47) 280, N.Y.State 481.

cleaning, (49) U.S.D.A. 175.

contamination of milk from, (47)

N.Y.State 180, S.Dak. 480, N.Y.
State 481.importance of sterilization, (42)
564.neglect in care of, effect, (44)
N.Y.State 272.

practicability, (50) Tex. 177.

sterilization, (44) 372; (47)

N.Y.State 480; (48) N.Y.State
79.

studies, (41) N.Y.State 277, N.Y.

State 278; (42) Calif. 71, 269;

(43) Minn. 679, N.Y.State 679;

(44) N.Y.State 95.

use in Scotland, (42) 283.

midday, value, (48) 175.

plants, electric power for, (47) 792.

process, discussion, (49) 173.

Milkweed—

insects in New Jersey, (46) 656.

poisonous to livestock, (42) 879; (44)

Nev. 874; (45) Wyo. 479.

whorled—

control, (49) Colo. 530.

poisonous properties, (45) U.S.
D.A. 178.poisonous to livestock, U.S.D.A.
(43) 470, 471; (46) 280.

problem in Colorado, (45) 46.

toxicity and eradication, (43)
Colo. 141.woolly-pod, poisonous to livestock,
(49) 583.

Mill feeds, marketing, (48) U.S.D.A. 391.

Mill stocks, offal content, (43) 314.

Mill wastes, use as wartime feeding stuffs,
(42) 369.

Miller's almanac, (46) 228; (49) 530.

Millet—see also Foxtail millet.

analyses, (47) Va. 823.

and cowpea varieties, comparison, (48)
Ga.Coastal Plain 628.and Sudan grass, comparative yields,
(41) Nev. 227.as affected by ammonium sulphate,
(47) Mass. 218.as affected by carbon dioxid in soil,
(43) N.Y.Cornell 813.

as forage crop, (46) Mass. 30.

as hay crop, (42) Mich. 631; (43)
527.

Millet—Continued.

as orchard cover crop, (43) Pa. 538.

as short season hay crop, (47) Mich.
131.as silage crop, (41) 732; (43) S.Dak.
200.

breeding experiments, (49) 735.

culture, (45) N.Dak. 734; (47) N.Mex.
333.culture experiments, (41) 333; (44)
N.Dak. 524; (49) Mont. 430, U.S.
D.A. 630.culture experiments in Sweden, (50)
735.

culture in Alaska, (41) Alaska 31.

culture in Burma, (41) 529; (42) 436.

culture in Morocco, (49) 595.

culture in the Sudan, (45) 538.

digestibility coefficients, (48) 574.

diseases, control, (43) Tex. 845.

early growth in alkali soil, (42) Utah
28.effect on succeeding wheat crop, (41)
N.Dak. 823.

fertilizer experiments, (49) 329.

field tests, (41) N.Dak. 824.

flour, analyses, (47) 764.

for silage, variety tests, (50) Can. 432.

hay, cost of production, (44) N.Dak.
190.

Indian, fungi affecting, (48) 145.

Japanese, analyses, (42) 866.

Japanese, variety tests, (49) Mont.
129.

pearl, Linnaean concept, (46) 721.

phosphorus requirements, (44) R.I. 31.

pollination habits, (50) 639.

response to fertilizers, (48) R.I. 518.

rotation experiments, (44) N.Dak. 524.

seed, analyses, (41) Can. 565.

seed production, (48) N.Dak. 225.

smuts, control, (48) 743; (49) 646;
(50) 349.

Striga lutea affecting, (49) 843.

v. Sudan grass for Ohio, (41) Ohio
234.

varieties, (45) Kans. 33.

variety tests, (41) Idaho 225; (42)

Minn. 825; (44) N.Dak. 30; (45)

Nebr. 531; (47) Nebr. 736; (48)

N.Dak. 224, Minn. 331; (49) U.S.

D.A. 630, Nebr. 733, Can. 734.

vitamin A content, (50) 364.

yields, (43) Minn. 636; (45) N.Dak.
225.Milling industry, effect of agricultural de-
pression, (47) 296.

Millipedes—

affecting truck crops, (49) Pa. 251.

migrating army of, (42) 755.

of lettuce and carrots, (50) Pa. 454.

under sash, control, (46) 662.

Milo—

analyses, (45) 41, Okla. 433.

as affected by preceding crop, (44)
Calif. 731.

as dry farm crop, (41) Ariz. 29.

Milo—Continued.

- breeding experiments, (43) Ariz. 734.
- chop, analyses, (41) Ariz. 367; (42) Tex. 769; (45) Tex. 68; (46) Tex. 675.
- cracked, analyses, (44) Ariz. 568.
- cross-fertilization, natural, (42) 34.
- cross-pollination, (46) 230.
- culture, (44) Ariz. 523.
- culture and uses, (44) U.S.D.A. 332.
- culture experiments, (43) U.S.D.A. 134; (44) Calif. 731; (47) N.Mex. 333; (47) Calif. 631.
- diseases and insect enemies, (44) U.S. D.A. 333.
- effect on following crop, (44) Calif. 731.
- effect on soil, (41) Kans. 34.
- feed meal, analyses, (42) Tex. 769.
- feeding value for pigs, (42) Calif. 870.
- for laying hens, (41) N.Mex. 571.
- growth and yields, (45) Tex. 233.
- head chop, analyses, (45) Tex. 68.
- irrigation water requirements, (47) Kans. 630.
- kernels, composition, (48) U.S.D.A. 309.
- manuring experiment, (43) U.S.D.A. 134.
- meal, analyses, (46) Tex. 675.
- meal, feeding value, (49) N.Mex. 869.
- resistance to alkali, (43) Ariz. 724.
- seed, digestibility and productive value, (47) Tex. 472.
- seeding experiments, (46) U.S.D.A. 637.
- smut, notes, (49) 839.
- smut resistance in, (41) Kans. 48, Mo. 654; (50) 243.
- variety tests, (42) Tex. 828; (43) U.S. D.A. 134.
- yields, (41) Ariz. 332, Mo. 637; (43) Ariz. 733; (44) Ariz. 524; (46) Mo. 326.

Mineola indiginella, *see* Leaf crumpler.

Mineola vaccinii, *see* Cranberry fruit worm.

Mineral—

- acids, detection in vinegar, (47) 109.
- elements in milk formulas for infants, (46) 862.
- industries, treatise, (47) 325.
- metabolism, *see* Metabolism.
- mixtures for pigs, (46) Iowa 73.
- mixtures for poultry, (48) Ohio 667.
- oils, *see* Oils.
- plant food, availability, (50) 21.
- products in Michigan, (48) 623.
- requirements—
 - of animals, (50) 266.
 - of dairy cattle, (48) 771; (49) 72.
 - of gilts on pasture, (49) 871.
 - of pigs, (48) 171, 398.
- resources—
 - nonmetal, of United States, (49) 124; (50) 820.
 - of Alsace-Lorraine, (42) 430.
 - of California, (46) 627.

Mineral—Continued.

resources—continued.

- of Nebraska, (44) 692.
- of New York, (46) 218.
- of Southern States, (42) 525.
- of Tennessee, (47) 420.
- of United States, (42) 19; (45) 816; (50) 727.
- of United States in 1918, (46) 425.
- of United States in 1919, (44) 130.
- of United States in 1921, (49) 727.
- salts, *see* Salts.
- soil, burnt, fertility, Minn. (47) 121; (48) 320.
- soils, exchange acidity of, (50) 514.
- soils, neutralizing value, (48) Mich. 319.
- supplements, effect on development of swine, (49) Okla. 468.
- supplements for pigs, (48) 475.
- supplements for poultry, (47) 175.
- waters, bromid in, (47) 713.

Minerals—

- and acids, equilibrium studies, (47) 213.
- decomposition by bacteria, (47) 213.
- feeding to pigs, (47) 776.
- for fattening pigs, (49) Iowa 774.
- importance in diet, (46) 259.
- soil, solubility, (47) 513.
- soil-forming, potash availability in, (47) Tex. 26.
- value for growing chicks, (50) 872.

Mines—

- effect on ground water level, (43) 210.
- effect on land and livestock, (44) 223.
- timber for, decay and preservation, (46) 454.

Minnesota—

- Crookston Substation, report, (48) 396.
- Duluth Substation, report, (48) 396.
- Grand Rapids Substation, report, (43) 898.
- Morris Substation, report, (42) 796; (44) 394; (47) 196; (48) 396.
- Northwest Station, report, (42) 899; (44) 394; (47) 397.
- State Fruit-Breeding Farm, report, (42) 637, 836.
- State Live Stock Sanitary Board, report, (49) 178.
- State testing mill, activities and equipment, (49) 831.
- State testing mill, description, (46) 499.
- Station, Northeast Demonstration Farm, report, (47) 196.
- Station, notes, (41) 700, 899; (42) 300, 498, 695; (43) 398, 497, 599; (44) 96, 299, 396; (46) 396, 699; (47) 699; (48) 697; (49) 196, 496; (50) 798.
- Station, report, (42) 899; (43) 698; (44) 795; (47) 397; (50) 195.

Minnesota—Continued.

University, notes, (41) 700, 899; (42) 498, 600, 695, 797; (43) 398, 497, 599; (44) 96, 396, 899; (45) 96; (46) 396, 699; (47) 699; (48) 697, 796, 898; (49) 196, 496, 899; (50) 397, 798.

Minnows, mosquito-destroying, studies, (46) 750; (48) U.S.D.A. 155.

Mint, culture and preparation of products, (50) 140.

Miridae, notes, (47) 756.

Miris dolobratus, notes, (41) Me. 162; (43) 256.

Miscibility, studies, (50) 805.

Mississippi—

College, notes, (41) 498; (43) 199, 700; (45) 96; (49) 299, 899.

Station, Holly Springs Branch, report, (45) 198; (47) 497.

Station, McNeill Branch, report, (45) 298.

Station, notes, (41) 100; (42) 600; (43) 99, 399, 700; (44) 497; (45) 96; (46) 396, 795; (47) 99, 399; (48) 796; (49) 299, 600.

Station, Raymond Branch, report, (49) 298.

Station, report, (47) 299; (49) 495.

Station, South Branch, report, (45) 298; (47) 497.

Stations, historical sketch, (49) 495.

Missouri—

Fruit Station, notes, (46) 499.

Fruit Station, reports, (46) 297.

Poultry Station, notes, (48) 299; (49) 496.

State Poultry Association yearbook, (50) Mo. 871.

Station, notes, (41) 100, 498, 599, 899; (42) 398; (43) 497; (45) 300, 699; (46) 299; (47) 99, 197; (48) 194, 499; (49) 196, 397; (50) 798, 899.

Station, report, (41) 699; (43) 798; (46) 394; (48) 694.

Station, report of director, (45) 298.

University, notes, (41) 100, 498, 599, 899; (42) 398; (43) 399, 497; (44) 497; (45) 699; (46) 299, 795; (47) 99, 197; (48) 194, 499, 797, 898; (49) 196, 397, 799; (50) 798, 899.

Mistletoe—

effect on seed of Jeffrey pine, (42) 241.

injury to trees, (42) 354; (46) 245.

on lime trees, (47) 546.

on pear trees, (45) 751.

on western yellow pine, (48) U.S.D.A. 648.

Mistletoes—

and hosts, (43) 821; (45) 357.

distribution in Switzerland, (41) 753.

sap concentration, (41) 632.

Mitchell grass hay, analyses and digestibility, (45) 468.

Mites—

affecting seeds, (45) 861.

and cleanliness, (42) U.S.D.A. 180.

and Isle of Wight disease, (46) 464.

depluming, of chickens, eradication, (42) 253.

dermanyssid, of North America, (50) 851.

fighting, summary, (47) West.Wash. 558.

from Japan and Formosa, (43) 260.

gasamid, annoying to man, (44) 356.

in flour and mill feed, (45) 852.

injurious to domestic animals, (48) 355.

nicotin sulphate dust for, (44) U.S. D.A. 651.

of stored grain and flour, (41) 456, 463; (42) 551.

parasitic, handbook, (49) 76.

predacious and parasitic, new, (44) 760.

relation to cleanliness, (44) U.S.D.A. 281.

Mitochondria—

effects of temperature, (50) 325.

in animals and plants, (46) 824.

in plant cells, (45) 30; (46) 29, 824; (50) 125.

in Preissia and corn, (44) 221.

nature of, (49) 819.

notes, (47) 127.

parasitism and resistance, (50) 244.

reaction against parasitism, (50) 22.

role in formation of plant substances, (50) 223.

types, (44) 823.

Mitosis in seminal epithelium of cats, (45) 371.

Mitosis, studies, (41) 861.

Mitosis, suppression during inanition, (42) 666.

Mixed feeds, analyses, (47) N.Y.State 172.

Mochlosoma lacertosa, parasites of white grubs, (42) 549.

Mocis frugalis, notes, (42) 751.

Mocis repanda, notes, (48) 357.

Mohair, exports from South Africa, (41) 772.

Mohair, grading, (46) U.S.D.A. 478.

Mohr pipette, use, (48) 411.

Moisture—

absorption of sugars, factors affecting, (49) 613, 614.

index of peach buds, (50) Md. 126.

tester, remedying defects in, (46) 414.

Molascuit, fertilizing value, (47) 218.

Molasses—

alcohol production from, (43) 617; (44) 414; (45) 83; (47) 113, 508.

amids, utilization by ruminants, (46) 67.

as fertilizer, (44) 218.

as fuel in sugar industry, (44) 627.

ash determinations, (49) 505.

bacteria in, (47) 48.

Molasses—Continued.

- beet, desaccharification, (41) 314.
- beet, effects on pigs, (43) 180.
- blackstrap, feeding value, (41) N.J. 73; (45) La. 775; (50) Miss. 69.
- cane, feeding value, (48) Wash.Col. 71.
- cane v. beet, feeding value, (47) 279.
- carbon, preparation and value, (41) La. 416.
- chemistry of, progress, (48) 712.
- cinder, fertilizing value, (47) 218.
- composition and calorific value, (41) 507.
- density of, apparatus for determining, (43) 806.
- dry substances in, (46) 507.
- effect on cane soils, (50) 820.
- feed, energy value, (47) 69.
- feed, for lambs, (42) Calif. 868.
- feeding value, (44) Kans. 769; (46) Iowa 362; (47) La. 470; (49) Nebr. 671, Miss. 869, Iowa 870.
- feeding value and methods of feeding, (47) 674.
- feeds, analyses, (41) Ind. 868, N.Y. State 868; (45) 872.
- feeds, composition and feeding value, (49) 370.
- feeds, sugar content, (41) Can. 565; (45) N.Y.State 469.
- fertilizing value, summary, (42) 816.
- for fattening steers, (44) 672.
- formation and exhaustibility, (43) 508.
- grain determination in, (43) 508, 509; (45) 719; (46) 312; (47) 717.
- moisture determination in, (44) 614.
- poisoned, for noctuid moths, (48) 852.
- poisoned, for pale western cutworm, (47) 851.
- reducing sugars in, determination, (43) 806.
- sludge, fertilizing value, (45) 519, 521.
- solids in, determination, (50) 202.
- sucrose determination in, (47) 112.
- use as fuel and fertilizer, (45) 818.
- use in manufacture of motor fuel, (49) 387.
- viscosity, effect of colloids, (47) 717.
- waste, motor fuel from, (43) 591.
- waste, potash from, (50) 324.
- waste, use in Philippines, (45) 209.
- waste, value for work animals, (45) 573.
- water content, (43) 509.

Molastego, fertilizing value, (47) 218.

Molastella, fertilizing value, (47) 218.

Mold—

- cause of mycosis of fetal membranes in cows, (42) 778.
- formation on cold storage meat, (47) 560.
- fungi, effects of acids, (43) 523.
- fungi, formation of soluble starches by, (43) 523.
- fungi in sugar inversion, (50) 728.
- fungi, utilization of organic substances by, (49) 126.

Mold—Continued.

hyphae in sugar and soil, (46) 431.

in bread, studies, (42) 162.

spores—

- enzymes in, studies, (42) 336, 803.
- in sugar, effect of concentration on activity, (42) 803.
- in sugar, factors affecting activity, (43) 507.
- in sugar, formation of levan by, (44) La. 116.
- invertase activity in sugar, (43) 433.
- resistance to sunlight, (47) 784.

Molding of snow-smothered nursery stock, (43) 846.

Molds—

- artificial cultures, preservation of, (42) 726.
- as affected by petroleum, (49) 19.
- behavior toward arsenic, (44) 78.
- black and yellow, of ear corn, studies, (45) Tex. 50.
- breeding on concentrated sugar solutions, (43) 524.
- destruction of pentosans by, (50) 110.
- development, factors affecting, (45) 463.
- effect on keeping quality of butter, (50) 476.
- effects of hydrogen-ions on, (47) Iowa 725.
- fermentation of pentoses by, (48) 203.
- formation of fruiting bodies in concentrated sugar solutions, (43) 226.
- growth, inhibiting effect of H-ion, OH-ion, and salt concentrations, (49) Iowa 722.
- in chemical wood pulp, (48) 150.
- in cream for butter making, (48) 80.
- in creamery butter, (44) 874.
- in drugs, detection, (47) 314.
- in grain, factors affecting susceptibility to, (45) 245.
- in soil, effect of seasonal conditions, (43) Iowa 432.
- in sweetened condensed milk, (48) 577.
- in vegetables, dehydrated, (48) 60.
- laboratory feeding to animals, (49) 674.
- on cold storage meat, (48) 258; (50) 763.
- on dehydrated food products, (43) 317.
- pathogenic, biologic properties, (47) 678.
- suppression during incubation of fungi, (47) 647.

Moldy bread outbreak, (49) Wis. 660.

Mole cricket—

European, notes, (44) 351.

Porto Rico, notes, (43) 159.

Mole crickets—

control, (48) Fla. 251.

of Java, (41) 847.

on grass roads, (43) 53.

Mole plows worked by horses, (41) 586.

Moles—

- American, (47) U.S.D.A. 155.
- habits, (48) 649; (49) 50, 250.
- life history and habits, (44) 751.
- trapping, (49) 756.

Molinia coerulea as a forage plant, (42) 438.

Molinia hay, composition and feeding value, (45) 168.

Molkenboden soils, chemical studies, (49) 811.

Mollisia earliana, notes, (47) 249; (48) 647; (49) N.C. 747.

Mollusk muscle, composition, (43) 568.

Mollusks, dipterous larvae on, (46) 57.

Mollusks, flies feeding on, (42) 454.

Molybdenum in Hagerstown soil, (49) Pa. 210, 617.

Momordica cochinchinensis, oil from seeds, analysis, (43) 316.

Monacrostichus sp., description, (43) 57.

Monamino acids in lactalbumin hydrolysis, (46) 503.

Monarda punctata as source of thymol, (41) 825.

Monarthropalpus buxi, life history and control, (46) 750; (50) 559.

Monascus purpureus, notes, (42) 416; (44) Conn.State 150.

Monatha sp., notes, (42) 361.

Monda spp., notes, (42) 361.

Money coefficients for conversion into metric system, (48) 97.

Mongoose in Kentucky, (46) 455.

Mongoose in West Indies, (41) 56.

Mongrels, elimination by pure-sire method, (42) 821.

Moniezia—

- expansa*, life cycle, (45) Wyo. 478.

- infection of lambs, (48) 678.

- sp., in sheep, (46) 685.

- sp., notes, (47) Okla. 85.

Monilia—

cinerea—

- and *fructigena*, differentiation, (43) 246.

- and *fructigena*, two forms, studies, (43) 48.

- differences on sweet and sour cherries, (45) 53.

- on cherries, (47) 844.

- disease of cacao pods, (44) 247.

- fimicola*, notes, (47) Calif. 646.

- fimicola* on mushrooms, (44) Calif. 744.

- fructigena*—see also Cherry, Peach, and Plum brown rot.

- notes, (41) 53; (45) 53; (46) 453.

- laxa*, notes, (47) 49.

- on orchard fruits, (42) 150.

- oregonensis* n.sp., description, (50) Oreg. 843.

- psilosis*, cause of sprue, (47) 371.

- sitophila*, penetration into hardwood, (50) 656.

- spp., notes, (43) 246; (44) 346.

Moniliopsis aderholdii, notes, (42) 46.

Monilochaetes infuscans, notes, (46) 551; (47) N.J. 448.

Monilochaetes infuscans on sweet potatoes, effect, (46) 135.

Monobelus fasciatus, notes, (49) 550.

Monocalcium phosphate, effect on soil extracts, (43) Mich. 124.

Monochaetia rosenwaldia n.sp., description, (50) 450.

Monochloroacetic acid, use as reagent, (42) 613.

Monocotyledons and dicotyledons, development, (45) 629.

Monocrepidius exul, notes, (45) 551; (47) 253.

Monocrepidius sp., notes, (43) U.S.D.A. 352.

Monodontomerus dentipes, notes, (49) 855.

Monodontomerus, genera close to, European species, (50) 256.

Monohammus fistulator, notes, (41) 555.

Monolepta rosea, notes, (41) 57; (49) 758.

Monomorium bicolor nitidiventre causing edema of eyelid, (41) 463.

Monomorium spp., notes, (46) 50.

Mononchus papillatus for control of plant-injurious nemas, (50) 251.

Monophlebinae, Japanese, studies, (48) 459.

Monophlebinae, notes, (49) 851.

Monophlebus n.spp., notes, (48) 459.

Monoplegma sphaerospermum, new genus, erection, (44) 820.

Monosaccharids, identification, treatise, (47) 312.

Monosporella unicuspidata n.g. and n.sp., description, (42) 854.

Monotropia, biology, studies, (50) 225.

Monotropomyces nigrescens, suggested name, (50) 225.

Monoxia puncticollis, studies, (44) U.S.D.A. 256; (45) 157.

Monsoon, causes and characteristics, (47) 809.

Monsoon rainfall, local distribution, (48) 208.

Montana—

- College, notes, (41) 100, 398; (42) 695; (43) 498, 899; (44) 497, 700; (45) 498; (46) 197; (48) 697; (49) 99, 900; (50) 900.

- grain inspection laboratory work, (49) Mont. 231.

- Station, notes, (41) 398; (42) 695; (43) 199, 498; (44) 497, 700; (45) 498; (46) 197, 795; (48) 697; (49) 99, 900; (50) 900.

- Station, report, (42) 496; (44) 394; (46) 394; (49) 195; (50) 195.

Moor—

- colonization in Germany, (44) 890.

- meadows, fertilizer experiments, (46) 530.

- soils—see also Peat soils.

- as affected by potassium-magnesium sulphate, (44) 515.

Moor—Continued.

soils—continued.

- as fertilizer for sand, (42) 515.
- bog, treatment, (41) 230.
- composition, (48) 615.
- crop experiments on, (45) 735.
- decomposition, determination of degree, (43) 213.
- drainage, (41) 230, 687.
- effect of liming, (44) 813.
- effect of water level on meadow plants, (43) 623.
- effect on composition of crops, (41) 422.
- evaporation as affected by sand, (44) 210; (48) 513.
- fertilizer experiments, (41) 519, 786; (42) 623; (44) 422.
- fertilizer requirements, (44) 140.
- German, agricultural and industrial opening, (48) 814.
- German, cultivation, (42) 512.
- hydrogen-ion concentration in, (45) 324.
- in Finland, (45) U.S.D.A. 621.
- irrigation, (41) 786.
- liming experiments, (41) 212, 520; (49) 726.
- lowland, reclamation and management, (48) 424.
- mixing with mineral soil, (42) 622.
- nitrate and nitrite in, origin, (44) 622.
- nitrification in, (41) 212.
- of Russia, agricultural value, (43) 623.
- reclamation in Holstein, (43) 185.
- relation of root development to lime in, (43) 623.
- reseeding frost-injured oats on, (41) 734.
- sanded and unsanded, evaporation of moisture, (43) 20.
- studies, (46) 215.
- use for soil improvement, (43) 22.
- use of guanin on, (45) 518.
- use of kainit and potash on, (45) 624.
- value for potato culture, (48) 833.
- Morchella esculenta, studies, (41) 834.
- Mordellistina pustulata, notes, (47) 854.
- Morles, studies, (41) 834.
- "Morgan," use of term, (43) 269.
- Moringa pterygosperma, notes, (46) 737.
- Moringa stem borer, life history, (45) 658.
- Morning-glory, wild, *see* Bindweed.
- Morphine—
 - content, relation to poppy flower color, (46) 125.
 - crystallography, (41) 801.
 - use in serum therapy of botulism, (48) 66.

- Morrill, J. S., biography, (50) 603, 693.
- Mortality as affected by restricted diet, (49) 767.
- Mortar cement, bonding, (41) U.S.D.A. 382.
- Mortar, limestone-asphalt, (41) 884.
- Mosaic disease—*see also specific host plants.*
 - and gummosis, relation between, (47) 48.
 - and related diseases in Idaho, (50) 745.
 - cross-inoculation and insect transmission, (48) 241, 355.
 - of annuals, overwintering, (47) 349.
 - of grasses, (42) U.S.D.A. 450.
 - of potatoes, (42) 47.
 - origin, (48) 346.
 - resistance of cane varieties, (42) P.R. 150.
 - virus, nature, (50) 746.
- Mosaic diseases—
 - effect of temperature, (47) 348.
 - in Quebec, (48) 242.
 - protozoa associated with, (48) Mich. 644.
 - studies, (46) 344, 743; (48) 544; (49) Mich. 45, Iowa 746; (50) 351, 648, 651.
- Moscow Regional Experiment Station, notes, (48) 899.
- Mosquito—
 - destroying top minnow, notes, (45) 555; (46) 750; (48) U.S.D.A. 155.
 - fauna of North Carolina, notes, (44) 854.
 - field station, notes, (44) 57.
 - larvae as affected by H-ion concentration, (46) 660.
 - larvae, effect of oil on, (50) 847.
 - larvae, toxicity of acids for, (50) 357.
 - plague, source, (46) 51.
 - repellent, creosote oil as, (48) 854.
 - traps in antimalarial work, (44) 759.
- Mosquitoes—*see also* Aedes, Anopheles, Culex, Malaria, *etc.*
 - and bats, (44) 759.
 - and drought of 1921, (50) 255.
 - and malarial control, (46) 381.
 - Argentina, notes, (42) 158.
 - as affected by weather, (43) 51.
 - attractants, (48) 156.
 - behavior, relation to atmospheric conditions, (50) N.J. 757.
 - breeding, (46) 248.
 - breeding in rice fields, (44) 758.
 - breeding places, aerial survey, (47) 760.
 - breeding, prevention, notes, (42) 361.
 - British, handbook, (44) 256.
 - chemotropism, (47) N.J. 553.
 - collected by Canadian Arctic Expedition, (42) 158.

Mosquitoes—Continued.

- control, (41) N.J. 58, Conn.State 159, 553, 666, 757; (42) 152, Calif. 848; N.J. 850; (43) Conn.State 252; (44) N.J. 351, 354; (45) Conn.State 149, N.J. 661; (46) 459, N.J. 557; (47) Conn.State 156; (48) U.S.D.A. 155, N.J. 354; (50) Conn.State 50.
- control in southern army camp, (44) 256.
- distribution in India, (47) 358.
- embryological studies, (46) 459.
- eradication, (43) N.J. 162, 258.
- eradication, treatise, (48) 156.
- flight through water pipes, (41) 461.
- habits and control in Florida, (48) 254.
- habits and distribution in Australia, (48) 254.
- in British Columbia, (43) 258; (47) 757.
- in California, (42) 548.
- in Canada, (45) 760.
- in England, (41) 358.
- in France, natural history, (50) 758.
- in Macedonia, (48) 459.
- in Panama, (45) 655.
- in Porto Rico, (47) 853.
- in United States, synopsis, (48) 57.
- infection from malaria patient, (44) 759.
- malarial, of Illinois, (43) 558; (49) 156.
- male hypopygium, nomenclature, (44) 59.
- manual, (47) N.J. 195.
- notes, (45) V.I. 150.
- parasites of, (47) 256; (48) 156.
- preferential feeding experiments, (50) 259, 847.
- relation to yellow fever, (41) 851.
- role in disease transmission, (45) 57.
- salt-marsh, fish enemy of, (44) 656.
- salt-marsh, in fresh water polluted by acid, (45) 555.
- species in Virgin Islands, (48) V.I. 354.
- State laws for control, (43) N.J. 162.
- survey, (46) P.R. 157.
- traps for, (47) 358.
- ultimate seasonal infection, (42) 854.
- work of Bureau of Entomology, (42) 548.
- yellow fever, *see* Yellow fever.
- Moss, absorptive capacity, (43) 812.
- Moss in orchards, control, (44) Oreg. 840.
- Moss rose, origin, (46) 842.
- Moss, Spanish, feeding value, (42) Tex. 369.
- Moth, diamond-back, notes, (45) V.I. 150.
- Moth, liparid, injurious to figs, (46) 559.
- Moth-proof fabrics, (47) 552.
- Moths—*see also* Lepidoptera.
- American, new tropical, (42) 156.
- eggs, photomicrographs, (47) 256.
- Eudemis and Cochyliis, in Bordeaux, (46) 851.

Moths—Continued.

- Mesopotamian, life history notes, (48) 554.
- new, from Mexico, (42) 652; (43) 258.
- noctuid, control, (48) 852.
- North American, revision, (49) 254.
- oecophorid, new genus and species, (42) 751.
- Motion pictures—
- for community needs, (47) 598.
- of United States Department of Agriculture, (48) U.S.D.A. 97.
- Motor—
- alcohol, theory and use, (47) 90, 189.
- cars and trucks, registered in 1920, (45) U.S.D.A. 82.
- cultivators, *see* Cultivators and Cultivation.
- equipment, use in farming, (42) 588.
- fuel—
- alcohol as, treatise, (49) 286.
- bacterial production, (46) 780.
- conservation, (42) 389.
- from vegetable oils, (48) 886.
- from waste molasses, (43) 591; (49) 387.
- treatise, (46) 87.
- volatility, (48) 885; (49) 887; (50) 887.
- fuels, blended, detonation characteristics, (47) 791.
- fuels, discussion, (43) 187; (48) 198.
- fuels, vaporization, (48) 785.
- oil barrels, use as silage containers, (45) 374.
- operation costs, factors affecting, (44) 86, 784.
- plows, *see* Plows.
- road transport, treatise, (47) 791.
- spirits and ethylite, (49) 590.
- traffic and road construction in United States, (48) 287.
- transport performance with varied fuel volatility, (49) 386.
- transportation—
- and rural schools, (44) 897.
- in rural Ontario, (47) 888.
- rural, (41) U.S.D.A. 383.
- treatise, (50) 189.
- truck—
- drives for bad roads, (41) 887.
- tires, impacts from obstructions in roads, (50) 286.
- traffic, efficiency of bituminous surfaces under, (41) 688.
- transportation, (46) 890.
- weights, economic limit, formula, (42) 588.
- trucks—
- and pavements, paper on, (44) 380.
- army, housing and equipment, (43) U.S.D.A. 591.
- braking tests, (41) 586.
- construction and care, (46) 890.

Motor—Continued.

trucks—continued.

- design and construction, treatise, (43) 285.
- economy of operation, (43) 187.
- export packing, (46) 383.
- heavy-duty drive axles, studies, (49) 888.
- high-speed, design, (46) 383.
- impact tests, U.S.D.A. (41) 689; (44) 85, 586; (45) 82; (46) 489.
- in the east, U.S.D.A. (44) 189, 485; (46) 87.
- notes, (48) 785.
- on Corn Belt farms, U.S.D.A. (44) 885; (49) 185.
- operating costs, (43) 85; (49) 888.
- pneumatic v. solid tires, (43) 286.
- rear axles, types of, (50) 287.
- relation between loads and grades, (42) 484.
- road design for, (44) U.S.D.A. 884.
- tests on concrete roads, (41) 584.
- tire maintenance, (41) 586.
- tires and rim equipment, (44) 486.
- tractive effort, analysis, (44) 284.
- treatise, (46) 890.
- use on sugar plantations, (42) 892.

vehicle transportation, (48) 185.

vehicles—

- alcohol as fuel for, (44) 785.
- and highways, (42) U.S.D.A. 780.
- care and operation, treatise, (43) 187.
- gas as source of power, (43) 86.
- gasoline consumption, relation to tractive resistance, (41) 486.
- ignition systems, (44) 786.
- in United States, U.S.D.A. (41) 383; (43) 689.
- registration, (46) U.S.D.A. 86.
- registry in Massachusetts, (47) 289.
- steam and gas, running costs, (43) 890.
- tractive resistance, (48) 683.

Motors, electric, fees and tests, (46) 491.

Motors, studies, (48) 887.

Mottling disease of sugar cane, *see* Sugar cane.

Mountaineers, southern, history, (45) 592.

Mountains, desert, vegetational features, (44) 134.

Mouse—*see also* Mice.

- autocæsarean section in, (48) 579.
- beach, new species from Florida, (44) 651.
- bean, notes, (42) 748.
- louse, tularaemia transmission by, (46) 663.
- oxyurid, parasite of man, (42) 847.

Mouse—Continued.

typhoid—

- epidemics, (48) 82, 83, 84; (50) 784.
- immunization, (47) 882; (50) 787.
- intestinal flora in, (49) 79.
- manner and spread, (49) 282.
- ox bile sensitization in, (49) 79.
- virulence and host susceptibility, (49) 281, 882; (50) 478.

Movement of organisms, new method of study, (42) 436.

Mowers, draft tests, (45) Wis. 291.

Mowing costs, horse and power, (49) 86.

Mowing machine, draft determination, (45) 791.

Mowing machines, studies, (49) Wis. 688.

Mucilage formation in cacti, (43) 226.

Mucilago spongiosa, notes, (45) 144.

Muck—

- crop diseases, studies, (41) Mich. 654.
- nitrogen, availability, (46) 120.
- nitrogen in, as plant nutrient, (47) Ind. 124.
- nitrogen, tests, (45) Ind. 522.

Muck soils—

- acid, effect of liming, (48) Mich. 325.
- and frost, (47) Mich. 117.
- chemical composition, (43) 22.
- classification, (49) Mich. 415.
- fertilizer experiments, (46) Mich. 518; (47) 725; (50) West.Wash. 520.
- fertilizer requirements, (49) Mich. 19.
- for greenhouse crops, (44) 719.
- formation of soluble substances in, (45) Mich. 620.
- frost in, causes, (48) 815.
- lime requirements, (43) 212; (49) N.C. 724.
- of Indiana, agricultural value, (44) 623.
- of North Carolina, (48) 211.
- of North Carolina, nitrification and acidity, (50) N.C. 320.
- of Ohio, (41) Ohio 212.
- reclamation and management, (47) 620.
- rôle of microorganisms in, (42) 514.
- run-off experiments, (45) 389.

Muck tankage, nitrogen availability in, (47) Tex. 217.

Mucor—

- glomerula, growth inhibiting factors, (49) Iowa 722.
- glomerula in soil, activities, (50) 620.
- mucedo, food requirements, (45) 465.
- mucedo, growth-promoting substance in, (48) 162.
- mucedo on cold storage meat, (47) 560.
- pusillus, description, (42) 162.
- racemosus, utilization of glucose as source of carbon, (45) 354.
- ramosus, notes, (49) 381.

Mucor—Continued.

- sp. in corn meal, (46) 356.
- stolonifer, parasitic action, mechanism, (50) 244.
- zygotes, resistance of, (43) 329.
- Mucormycosis** in swine, (49) 381.
- Mud**, Canton and Chinese fish pond, composition, (50) 319.
- Mulatinhos**, analyses, (44) 460.
- Mulberries**—

- culture in China, (42) 640.
- insects affecting, (45) 359.
- preserving, (45) 665.
- specialized culture for silkworm, (42) 536.
- white, dioeciousness, (44) 428.
- Mulberry**—
- bark disease, notes, (41) 752.
- die-back, (45) 850.
- disease, cause, (47) 49; (49) 350.
- glucose absorption by aerial parts, (41) 818.
- leaf spot, (47) 839.
- mealybug, notes, (47) 255.
- scale, biological control, (41) 847.
- scale, parasite of, (50) 459.
- thrips, notes, (47) Fla. 656.
- tukra disease, notes, (45) 656.

Mulches, value in preserving soil moisture, (49) 317.

Mulching experiments, (50) Mo. 15.

Mule—

- colts, feeding experiments, (42) Kans. 263.
- mange, treatment, (43) 184.
- peracute disease, bacteriologic studies, (42) 884.

Mules—

- as affected by red buckeye, Ala.Col. (44) 778; (47) 785.
- as substitutes for work horses and oxen, (43) 573.
- blood of, (49) 683.
- Borna disease of, (43) 83.
- breeding in Catalonia, (47) 866.
- breeding in North Africa, (42) 560.
- farm work, feeding, (49) 69.
- feeding experiments, (46) U.S.D.A. 531. Ill. 677; (47) N.C. 576.
- feeding in Hawaii, (48) 169.
- glycogen and glucose in muscles, (49) 570.
- international trade, (46) 675.
- production, (50) U.S.D.A. 71.
- rough rice for, (45) La. 68.
- soy beans for, (50) Ill. 675.

Müll, fertilizing value, (46) 720.

Mullein, transpiration, (44) 518; (45) 527.

Multiceps spalacis, notes, (49) 400.

Mungo bean wilt disease, notes, (48) Calif. 527.

Mungo beans—

- adaptation and behavior, (48) Calif. 527.
- analyses, (44) Hawaii 71.

Mungo beans—Continued.

- as green manure, (42) Guam 31.
- behavior and adaptation, (49) Fla. 824.
- breeding experiments, (50) P.R. 533.
- culture experiments, (41) Tex. 36; (42) Tex. 828; (44) P.R. 433; (45) Guam 34.
- disease of, (50) S.C. 648.
- notes, (46) Guam 726.
- proteins of, (44) 709.
- returns from, in Georgia, (49) 90.
- sprouted, vitamin content, (46) 667.
- variety tests, (44) P.R. 433; (49) Guam 426.

Muratella coffeae n.sp., notes, (42) 542.

Murgantia histrionica, *see* Harlequin cabbage bug.

Muriate of potash, *see* Potassium chlorid.

Muridae, structure and classification, (43) 250.

Mus—*see also* Mice and Rats.

norwegicus albinus, studies, (42) 376.

Musa—

- sapientum, Philippine varieties, (42) 443.
- species, in Philippines, key, (42) 443.

Musca—

- australis*, life history, (50) 359.
- corvina*, Empusa disease in, (42) 361.
- domestica*, *see* House flies.
- spp., notes, (50) 358.
- spp., transmitters of Habronema, (50) 455.
- vetustissima*, life history, (50) 359.

Muscidae, Indian, notes, (50) 156.

Muscids, hibernation, (44) 57.

Muscle—

- ammonia concentration in, (41) 616.
- autoxidizable constituent, (46) 110.
- chemical dynamics, (47) 62.
- protein, isoelectric point, (49), 110.
- skeletal, insulin-like substance in, (50) 864.
- tissue, determination of creatin in, (49) 613.
- tissue, enzymes in, (48) 361.

Muscle Shoals—

- hearings on, (48) 218.
- plant and nitrogen supply, (48) 120.
- project, paper on, (46) 522.

Muscles—

- of the extremities, sympathetic innervation, (49) 378.
- zinc content, (42) 758.

Muscoid flies—

- chalcid parasites of, (50) 359.
- new genera and species, (42) 157.

Muscovite, potassium content, (50) 521.

Muscular—

- work, effect on blood, (43) 265; (46) 475.
- work, effect on composition of urine, (47) 264.
- work, effect on metabolism, (47) 665.

Muscular—Continued.

- work, effect on oxidation, (47) 167.
- work, physiological cost, (45) 670; (46) 571, 572.

Musculus complexus, factor in hatching of chicks, (43) 169.

Mushroom—

- brown blotch disease, (44) 644.
- diseases in England and Wales, (49) 645.
- mold disease, notes, (47) Calif. 646.
- root rot, notes, (43) 347; (46) Wash. 449.

Mushrooms—

- culture, (41) 339; (42) Md. 341, 534; (43) 437.
- edible, vitamin in, (50), 856.
- food value, (41), 66.
- gill, key, (46) 322.
- Monilia fimicola* on, (44) Calif. 744.
- of Ontario, (50) 643.
- powdered, as spice adulterant, (42) 415.
- studies, (41) 834.
- substitutes in Germany, (43) 204.
- vitamin B in, (48), 162.

Muskog, culture experiments, (41) Minn. 387.

Muskmelon—

- anthracnose, control, (47) U.S.D.A. 751.
- bacterial wilt, control, (43) U.S.D.A. 245.
- downy mildew, control, (49) N.C. 747; (50) S.C. 648.
- fruit rot, (46) 543.
- mildews, control, (42) Guam 38.
- seed proteins, (49) 714.

Muskmelons—

- as affected by alkalinity, (48) Calif. 524.
- breeding experiments, (41) N.J. 43; (44) P.R. 442; (48) P.R. 235; (50) P.R. 540.
- cost of production in Colorado, (44) U.S.D.A. 789.
- culture, (41) Mich. 147.
- disease resistance of, (45) 647.
- dusting experiments, (47) Va.Truck 236.
- early growth in alkali soil, (42) Utah 28.
- effect of "nipping" vines, (45) 835.
- handling and transportation, (45) U.S.D.A. 134.
- new, (45) 833.
- spraying and dusting experiments, (49) Va.Truck 233.
- variety tests, (43) Tex. 36; (46) S.C. 733, 839; (47) Miss. 831; (50) U.S.D.A. 138.

Muskkrats, breeding, (48) 768.

Muskkrats in Bohemia, (41) 56.

Mussaenda philippica, culture, (44) P.R. 235.

Mussel mud deposits, fertilizer value, (42) 127.

Mustard—

- as affected by guanol, (44) 25.
- as affected by Peruvian bark residue, (44) 25.
- assimilation of phosphoric acid by, (44) 722.
- chemistry and industry of, (42) 115.
- culture, (43) 638; (44) 436.
- diseases, notes, (41) 745.
- effect on soil acidity, (47) 723.
- fertilizer experiments, (41) 816; (42) 19, 223; (44) 24; (49) 20.
- for laying hens, (49) Can. 70.
- gas, action on plants, (45) 28.
- germination as affected by organic substances, (41) 523.
- insects affecting, (41) 455.
- liming experiments, (45) 625.
- mosaic disease, (46) 148.
- oil as milk preservative, (45) 111.
- oil, preserving value, (42) 114.
- oil, vitamin A in, (47) 661.
- pastured-off, effect on following crop, (41) 826.
- seed oil, production, (44) 436; (46) 636.
- seed substitutes, (44) 429.
- varieties for oil production, (44) 138.
- wild, control by spraying, (41) 537.
- yellow, seeding experiments, (41) 230.

Mustards, table, analyses, (41) 263.

Mutanda ornithologica, (42) 249; (45) 358.

Mutants and hybrids, (48) 829.

Mutation—

- among hog colera bacilli, (50) 788.
- and adaptation as result of fire, (46) 27.
- black-eyed yellow, in rats, (50) 822.
- discussion, (44) 135.
- in adzuki bean, (42) 224.
- in citrus, (47) U.S.D.A. 143.
- in *Drosophila*, studies, (50) 823.
- in house mouse, (46) 268.
- in jimson weed, (41) 634.
- in man and incidence of hereditary traits, (49) 567.
- in *Matthiola*, (42) 141.
- in *Nicotiana sylvestris*, (49) 128.
- in *Oenothera*, (41) 224, 431, 634, 821; (42) 332.
- in *Portulaca*, (47) 629.
- in pure line barley, (46) 531.
- inheritance, (50) 729.
- new, in an inbred strain of *Drosophila*, (49) 770.
- papers on, (49) 567.
- reverse, in *Drosophila*, (50) 331.
- studies, (43) 729; (49) 24.
- theory of Mendel, (44) 631.
- theory, present position, (45) 122.
- types of, (46) 27.
- types, significance in evolution, (47) 524.

Mutations—

- and anomalies in plants, (46) 524.
- and evolution, (46) 524.

Mutations—Continued.

- half and mass, studies, (43) 222.
- theoretical discussion, (43) 67.
- Mutillidae of Minnesota, (50) 755.
- Mutton—
 - autolysis, (49) 11.
 - bacterial food poisoning from, (48) 468.
 - carcasses, space-saving method of preparing, (41) 672.
 - cold storage, cooking, (44) 61.
 - cold storage holdings, (49) U.S.D.A. 893.
 - dressing and cutting on the farm, (46) Iowa 477.
 - export trade of New Zealand, (42) 867.
 - frozen, British trade in, (47) 275.
 - gastric response to, (41) 857.
 - home curing and recipes, (44) U.S.D.A. 471.
 - poisoning from paratyphoid infection, (42) 273.
 - production in Germany, (44) 72.
 - production in United States, (41) U.S.D.A. 892.
 - trade, British import, (42) 867; (44) 866.
 - trade, international, (46) 675.
 - use in diet, (49) U.S.D.A. 660.
- Mycelophage castaneae n.sp., notes, (48) 747.
- Mycetophilidae, monograph, (43) 661
- Mycobacteria from soils, studies, (44) 622.
- Mycoderma sp. in banana must, (41) 716.
- Mycogone sp., notes, (47) 547.
- Mycological and phytopathological notes, (50) 142.
- Mycology—
 - Imperial Bureau of, (47) 43.
 - Portuguese glossary, (50) 345.
 - synthesis in, (42) 726.
- Mycoplasma theory, (43) 444; (48) 451.
- Mycorrhiza in Ericaceae, (49) 424.
- Mycorrhiza in orchids, (49) 424.
- Mycorrhiza, notes, (43) 731.
- Mycorrhiza of coniferous trees, (48) 725.
- Mycosis of turkeys, (41) 481.
- Mycosphaerella—
 - bolleana n.sp., notes, (46) 722.
 - citrullina, notes, (47) 48; (50) 651.
 - fragariae, notes, (48) 842.
 - fragariae, resistance to, (48) 827.
 - gossypina, notes, (46) 847.
 - grossulariae, notes, (46) 243.
 - life history, (43) Md. 151.
 - rubi n.sp., description, (48) 848.
 - rubina, notes, (45) 751; (50) 751.
 - sp., notes, (46) 454.
- Mycrothriaceae in South Africa, key, (44) 642.
- Myelois—
 - ceratonia, notes, (42) 547.
 - venipars n.sp., description, (49) 155.
 - venipars, survey in Arizona, (49) 452.
- Myelophilus piniperda, notes, (46) 558.
- Myelophilus spp., notes, (41) 453; (44) 250.
- Myersia, new species, (45) 663.
- Myiasis, cutaneous, cases of, (48) 157.
- Myiasis in man and animals, Diptera causing, (49) 55.
- Myiodaria, parasitic on birds, (47) 555.
- Mylabris obtectus, *see* Bean weevil.
- Myobium myzomyiae, paper on, (45) 58.
- Mycocera cremides, parasite of white grubs, (42) 549.
- Myochrous longulus, notes, (42) Ariz. 357.
- Myogenesis, stimulus, (44) 264; (46) 263.
- Myoporum deserti, feeding experiments, (48) 168.
- Myosin, isoelectric point, (49) 110.
- Myosotis, variety tests, (41) 242.
- Myriangium sp. on grapefruit, (50) 752.
- Myrmecophiles, West African, notes, (48) 256.
- Myrmecophilous insects from Cuba, (42) 160.
- Myrmelachista ambigua ramulorum, notes, (49) 550.
- Mysidia n.sp., description, (47) 255.
- Mytilaspis pomorum, *see* Oyster-shell scale.
- Myxobacterales, subgroups and genera, (41) 821.
- Myxomycetes of Ontario, (45) 144.
- Myxosporidia, studies, (45) 452.
- Myxosporium corticolum, notes, (44) Conn. State 149; (49) 44.
- Myxosporium valsoideum on plane, (41) 353.
- Myzaphis abietina, notes, (47) 551.
- Myzocallis alhambra n.sp., description, (43) 660.
- Myzocallis n.spp., studies, (42) 155.
- Myzoides persicae, control in Deli, (41) 354.
- Myzomyia—
 - ludlowi, biology, (41) 460; (45) 57.
 - ludlowi, relation to malaria, (41) 553.
 - rossii, observations, (42) 751.
- Myzus—
 - brevipilosus n.sp., life history, (47) N.Y.State 455.
 - cerasi, *see* Cherry aphid.
 - fragaefolii, notes, (47) Ark. 455.
 - persicae, *see* Peach aphid, green.
 - ribis, *see* Currant aphid.
 - spp., parasite of, (48) 753.
- Naartjes, culture in South Africa, (41) 540.
- Nabis spp., life history, (50) 453.
- Naja bungarus, trematode from gall bladder, (49) 499.
- Najas marina, aquatic caterpillar on, (49) 54.
- Nami, culture directions, (45) 35.
- Nannus, wrens of genus, notes, (42) 847.
- Naphthalene—
 - as remedy for chicken lice, (42) 252.
 - effect on plants, (46) 544.
 - insecticidal value, (44) U.S.D.A. 162.

Naphthalene—Continued.

sulfonic acids, detection, (44) 711, 806.

sulfonic acids, difficultly soluble salts, (44) 711.

Naphthalin-phthalic anhydrid, (42) 205.

Napicladium tremulae, notes, (45) 550; (48) 51.

Napier grass—

culture experiments, (48) V.I. 333.

culture in Florida, (41) Fla. 37.

notes, (49) Guam 427.

palatability of silage from, (49) Ga. 524.

rotation experiments, (42) 230.

Narcissus—

bulbs, distribution, (42) U.S.D.A. 346.

disease, studies, (43) 350.

eelworm disease, control, (43) 49, 247; (44) 451; (45) 54; (46) 553.

flies, large and small, (50) 156.

nematode disease, control, (45) 851.

nematode disease, notes, (50) 452.

varieties, (42) U.S.D.A. 346.

Nasonia brevicornis—

life history, (45) 458.

notes, (50) 359.

structure and development, (50) 356.

studies, (42) 160, 362.

Nasturtiums—

aerial fertilization with carbon dioxide, (41) Vt. 833.

breeding experiments, (43) 222.

culture, (49) Alaska 435.

Nasutitermes—

morio, notes, (46) 559.

new genus, (43) 256.

Natada nararia, notes, (47) 357; (49) 455.

Natal grass, culture experiments, (41) Ariz. 331.

Natalensia, new genus, erection, (42) 155.

National—

Agricultural Conference, editorial, (46) 301.

Agricultural Conference, report, (47) 296.

Association of Farm Equipment Manufacturers, proceedings, (48) 386.

Board of Farm Organizations, (44) 893.

Congress for the Agricultural Restoration and Betterment of Rural Life in Belgium, (42) 701.

Congress of Agriculture and Live Stock Raising, (48) 395.

Congress of Mutual Aid and Cooperation in Agriculture, (48) 597.

Congress of Physiology, (44) 859.

Dairy Show, Government exhibit in 1920, (44) U.S.D.A. 289.

Education Association, (48) 95, 895.

Education Association, proceedings, (50) 896.

Farm Loan Association, organization, address, (42) 291.

Farmers' Union, outline of work, (43) 895.

National—Continued.

Federation of Agricultural Associations for France, (48) 496.

Fertilizer Association, history, (42) 223.

Fertilizer Association, proceedings, (42) 432; (44) 424; (48) 522.

Forest Reservation Commission, report, (43) 839.

forests, *see* Forests, national.

Formulary of United States, (42) 556; (46) 178; (47) 483; (48) 480.

Game Preserve. Pisgah, regulations, (44) U.S.D.A. 651.

Institute of Agricultural Botany, organization and functions, (48) 395.

Lime Association, proceedings, (49) 124.

Park Service, (48) 739.

Park, Yosemite, handbook, (46) 41.

parks, administration, report, (42) 539; (44) 641; (48) 541.

parks, Canadian, report, (49) 838.

parks portfolio, (46) 842.

Research Council—

fellowships, (48) 797.

new building for, (50) 601.

present organization, (42) 97.

project on salt requirement of plants, (44) 130.

Society of Dairying, report, (48) 577.

Nations, development, significance of environment, treatise, (48) 492.

Natural history studies, (45) 399.

Nature study—

and agriculture, treatise, (44) 898.

and humaneness, syllabus, (41) 494.

civic, textbook, (41) 598.

course, Calif. (41) 95, 597.

courses in Texas, (43) 598.

elementary, course of study, (50) 796.

elementary, in Wisconsin, (43) 797.

for teaching conservation, (42) 693.

helps for rural teachers, (44) 391.

in Canada, (41) 896.

in elementary schools, (42) 693.

of animals and plants on the farm, (48) 396.

outlines for rural schools, (49) Calif. 195.

relation to boys' and girls' club work, (42) 795.

source book, (42) 92.

survey, (45) 296.

teaching in college, (42) 92.

textbook, (41) 97.

Navel infection in colts, (42) Okla. 561.

Navel-ill, *see* Joint-ill.

Navy beans—

carbohydrate content, (45) 714.

fumigated, hydrocyanic acid absorption and retention, (49) U.S.D.A. 456.

new globulin from, (48) 802.

proteins in, nutritive value, (42) 756.

vitamin B determination, (44) 261, 562.

Neat's-foot oil, composition, (48) 310.

Nebraska—

- College of Agriculture, accomplishments, (48) 599.
- College of Agriculture, activities, (48) Nebr. 692.
- Dairymen's Association, proceedings, (47) 877.
- Potato Improvement Association, report, (45) 40, 535; (49) 34.
- Station, notes, (41) 498, 899; (42) 197, 695; (43) 199, 498, 700, 899; (45) 96; (46) 396, 700; (47) 197, 899; (49) 99, 397.
- Station, report, (41) 495; (43) 698; (45) 599; (47) 799; (49) 798.
- University, notes, (41) 498, 899; (42) 197, 498, 695; (43) 199, 498, 700, 899; (44) 97; (45) 96, 800; (47) 197, 899; (49) 99, 397.

Necator—

- americanus, notes, (48) 182.
- americanus, pharynx and alimentary canal, (50) 160.
- suillus n.sp., description, (47) 588.

Necrobacillosis—

- in lambs, (42) Calif. 884.
- in pigs, (41) 87, 474, 777, 781, 783; (42) 878.
- in sheep, (46) Mont. 374.
- in sheep, cause, (45) 385.
- intestinal, (45) 788.
- intestinal, in shotes, (46) Ky. 884.
- lesions in, (47) 585; (49) 178.
- paper on, (42) 877; (45) 680.
- studies, (43) Wyo. 179.
- summary, (50) Colo. 684.

- Necrology, notes, (42) 100, 699; (44) 799; (46) 199, 400, 599, 799; (48) 100, 399, 798; (49) 399; (50) 499.

- Necrosis bacillus, immunization, (45) 579.

- Nectarine bark fungus, notes, (45) 842.

- Nectarine scab, (46) 453.

Nectarines—

- dried, energy value, (46) 859.
- inheritance of morphological characters, (45) 539.
- insects affecting, (44) 548.
- new or noteworthy, (49) N.Y.State 338.
- pollination experiments, (47) Calif. 639.
- spraying experiments, (49) Calif. 53.
- stocks for, (45) 742.

Nectria—

- cinnabarina, notes, (43) 444, 552, 754; (50) 248.
- cinnabarina, parasitism of, (49) 649.
- cinnabarina, studies, (45) 147.
- ditissima, control, (46) 552.
- ditissima, culture, (45) 147.
- ditissima, notes, (42) 450; (43) 246; (44) 346, 842; (49) 44.
- galligena in Pacific States, (50) 148, 750.
- galligena, life history, (47) 349.
- galligena, notes, (47) Calif. 649.

Nectria—Continued.

- ipomoeae, notes, (46) 844.
- sp., notes, (45) 649; (49) 540.
- sp. on birch, (41) 752.
- spp., notes, (47) 754; (50) 42.

Negro—

- Land-Grant College Presidents, Conference, (50) 498.
- migration, (46) 189.
- schools, home making courses in, (50) 597.

Negroes—

- in rural education and country life, (48) 96.
- in Tropics, metabolism, (46) 671.
- teacher-training institutions for, (50) 495.

- Neleucania albilinea limitata, life history and control, (43) 54.

- Nematocampa limbata, studies, (41) N.Y. Cornell 161.

- Nematocera of Mesopotamia, (46) 59.

Nematode—

- disease, new, of soy bean, (46) 242.
- disease of red clover, (42) 742.
- diseases in Sweden, (48) 51.
- galls on wheat, recognition, (42) 245.
- injury on sugar cane, (42) 150.
- injury to plants, notes, (44) Pa. 746.
- parasites of sheep in Pennsylvania, (46) 685.
- resistance in peach, transmission, (50) 140.
- root knot, control experiments, (42) 243.
- secretions, effect on coagulation of blood, (45) 477.

- Nematodes—see also Heterodera.

affecting—

- citrus trees, (42) Calif. 842; (48) 548.
- clover, (43) 46.
- coconuts, (42) 747; (43) 551.
- garden crops, (49) 149.
- narcissus, (43) 49; (44) 451; (45) 54; (46) 553.
- orange roots, (43) 48.
- pea roots, (41) 51.
- potato, (45) 146.
- rice, (41) 64.
- tomatoes, control, (43) 47.
- various crops, (42) 150.

- catch plant methods for combating, (48) 246.

- causing parasitic gastritis, (41) 479.
- control, (41) N.J. 50, Fla. 548, 660, 846; (43) 350, 659.
- control with hot water, (50) Va.Truck 843.

- economic value of study, (47) 846.
- from donkey, studies, (42) 776.
- from fowls, new, (42) 180.
- greenhouse, control, (48) N.Dak. 52.
- injurious to hides, (47) 181.
- injurious to sugar cane, (45) 651.

Nematodes—Continued.

- injurious to tobacco, (48) 454.
- leaf-and-stem infesting on strawberries, (49) Oreg. 539.
- new genera, (46) 151; (47) 846.
- of Barbary, natural history, (49) 482.
- parasitic, ensheathed larvae of, (47) 252.
- parasitic on cultivated plants, (50) 452.
- parasitic, staining and mounting, (48) 150.
- parasitizing man, new, (42) Minn. 848.
- parasitizing turtles, (41) 753.
- penetration into mammals, (46) 882.
- plant resistance to, (47) Ga. 444.
- predatory, for control of plant-injurious nemas, (50) 251.
- stem and bulb infesting, (50) 754.
- summary, (50) 51.
- transference for economic purposes, (43) 449; (45) 654.

Nematodirus—

- new species, description, (45) 452.
- spp., measurements of eggs, (46) 777.

Nematus—

- abietum, outbreak, (44) 356.
- erichsonii, studies, (49) 454.

Nemeritis canescens, notes, (45) 655.

Nemocera, catalogue, (44) 552, 854.

Nemocera, new genus, description, (45) 361.

Neoarspenamin, parasiticide power, (47) 882; (49) 479.

Neoclytus erythrocephalus, notes, (45) 662.

Neodiprion lecontei, life history, (45) 159.

Neoechinirhynchidae, synopsis, (41) 464.

Neoeurhynchothrips, new genus, description, (50) Fla. 660.

Neofabraea malicorticis, notes, (44) 346; (47) Calif. 649.

Neofiber alleni, notes, (42) 748.

Neohedobia, new genus, erection, (42) 159.

Neomaskellia bergii, studies, (47) 255.

Neon light, experiments, (46) 640.

Neosymydobius, new genus, erection, (43) U.S.D.A. 758.

Neotermes, notes, (43) 256.

Neotettix proavus, long-winged or caudate phase, (41) 59.

Neothomasia, new name, (43) U.S.D.A. 758.

Neotoma spp., notes, (42) 355.

Neotoxoptera violae and its allies, (43) 54.

Neotrama, new genus, erection, (43) U.S. D.A. 758.

Nep, factors responsible for, (47) 34.

Nephantis serinopa, notes, (50) 455.

Nepheline, use as potassic fertilizer, (49) 817.

Nephelometer—

- for chlorin determination, (42) 611.
- modifications, (50) 312.
- new, principles of measurement, (45) 412.

Nephelometer-colorimeter, improvements in, (45) 805.

Nephelometers, descriptions, (47) 507.

Nephotettix spp.—

- life history and habits, (44) 58.
- notes, (45) 656.
- on rice, (47) 254.

Nephritis—

- diet used in treatment, (41) 561.
- in sheep, organism from, (45) 887.
- notes, (44) 881.
- spontaneous, of rabbits, (48) 183.

Nereocystis luetkeana, osmotic pressure of, (42) 131.

“Nerve bacillus,” studies, (43) 472.

Nerve stimuli, relation to oviducal secretions in birds, (46) 267.

Nervous system, comparative anatomy, (46) 880.

Nesomimesa hawaiiensis, parasitic on sugar cane leafhopper, (43) 662.

Ness berry, new hybrid, (49) Tex. 435.

Nessler's solution, regeneration, (41) 712.

Nests—

- open and trap, (41) Wash. 292.
- trap, for ducks, (49) 374.
- trap, homemade, construction, (49) 288.
- trap, types, (50) Can. 779.

Netherlands Institute of Animal Nutrition, notes, (43) 800.

Nettle—

- as fiber crop, (48) 130.
- feeding value for poultry, (49) 172.
- fiber content, estimating, (50) 335.
- meal, composition and digestibility, (43) 267.
- silver-leaf, notes, (49) 845.

Neuritis in poultry, (50) 685.

Neurotoma inconspicua—

- in South Dakota, (41) 59; (46) 58.
- studies, S.Dak. (41) 251; (42) 850; (44) 555, 652.

Neurovaccine, persistence in organs of immunized animals, (49) 782.

Nevada—

- Station, notes, (41) 899; (42) 498, 797; (43) 498, 700; (44) 299; (46) 299, 396; (50) 599.
- Station, report, (41) 299; (43) 298; (47) 196, 799; (49) 696.
- University, notes, (41) 899; (43) 700; (47) 699; (49) 99.

New England—

- Research Council, (46) 799.
- Standard Nine grades of fertilizer, use, (49) 726.

New Hampshire—

- College, notes, (41) 499; (42) 600; (43) 199, 498; (48) 600.
- Station, notes, (41) 499; (43) 199, 498; (44) 298, 700; (45) 96; (46) 197; (48) 600; (49) 99, 600.
- Station, report, (43) 98; (46) 394; (47) 497; (49) 395.
- Station, survey of research, (46) 394.
- University, notes, (49) 99.

New Jersey—

- Alfalfa Association, proceedings, (43) 528.
- State Potato Association, proceedings, (43) 531.
- Stations, notes, (41) 498, 899; (42) 300, 696; (43) 199; (45) 97, 699; (46) 795, 899; (47) 197; (48) 397, 697; (49) 197, 698; (50) 698.
- Stations, report, (41) 98; (42) 899; (44) 394; (46) 598; (48) 396.

New Mexico—

- College, notes, (41) 900; (42) 696; (44) 97, 299; (46) 97; (48) 698; (49) 197.
- Station, notes, (41) 398, 900; (42) 797; (43) 200; (44) 97, 299; (45) 499; (46) 97; (48) 698; (49) 197.
- Station, report, (41) 198; (43) 397; (46) 394; (47) 497; (49) 599.

New York—

- Cornell Station, notes, (41) 499; (42) 93, 900; (43) 299, 900; (44) 396, 797; (45) 97, 699; (46) 396; (49) 698, 900.
- Cornell Station, report, (45) 298; (46) 898; (48) 694.
- Cornell Station, research activities, (50) 898.
- Produce Exchange, report, (47) 597.
- State College of Agriculture, report, (48) 692.
- State experiment stations, union of, (49) 2.
- State Institute of Applied Agriculture, (46) 300, 900.
- State Station—
 - bulletins and periodicals available, (49) 97.
 - list of projects, (49) 97.
 - notes, (41) 300, 700; (43) 100, 200, 399, 498, 700, 799; (44) 299, 397, 497; (45) 97, 700; (46) 299, 499, 700, 796, 899; (47) 99, 399; (48) 194, 397, 797, 898; (49) 197, 497; (50) 397, 698, 900.
 - program of development, (49) 97.
 - report, (41) 397; (44) 95; (45) 198, 698; (46) 698; (47) 599; (49) 97; (50) 597.
 - report of director, (43) 598.
 - work and results, (49) 798.

State Veterinary College, (41) 696.

Newspaper, country, treatise, (49) 595.

Nezara hiliaris on peaches, (48) 457.

Nezara viridula—

- a peculiarly marked adult, (44) 352.
- control, (49) V.I. 352.
- hibernation, (41) Fla. 548.
- in citrus groves, (41) 355.
- life history and control, (42) 851.
- notes, (45) V.I. 150; (48) U.S.D.A. 51, Fla. 251.
- on pecan, (50) 556.
- studies, (41) 251; (50) 52.
- summary of information, (44) 549.

Nickel—

- catalyst, preparation, (50) 309.
- determination in vegetable oils, (42) 610.
- in arable soils, (48) 19.
- in plants, (49) 520.
- possible toxicity in hydrogenated oils, (42) 255.
- use in crucibles, (42) 207.

Nicodust improvement, (48) Calif. 542.

Nicotiana—

- chinensis*, description, (42) 636.
- effects of illuminating gas on abscission of flowers, (42) 333.
- fasciation in, (42) 332.
- hybrids, partial sterility in, (49) 25.
- rustica*, aurea character, (41) 440.
- rustica*, culture, (49) 36.
- self-sterility in, (41) 223, 431; (42) 527.

spp., ovular metamorphoses, (44) 630.

tabacum, gigantism in, (41) 440.

tabacum, inheritance in, (44) Calif. 726.

tabacum varieties, crossing, (47) 29.

Nicotin—

- as a poultry vermifuge, (49) 684.
- content of South African tobacco, (48) 231.

content of tobacco smoke, (48) 750.

delivery from dust carriers, (48) 749.

determination in tobacco, (49) 807.

dust—

effect of carriers on killing power, (47) Va.Truck 236.

for control of walnut aphid, (42) Calif. 852.

for grape leafhopper, (45) 757.

insecticidal value, (46) 852; (47) Va.Truck 236, U.S.D.A. 555; (48) U.S.D.A. 457, 853.

making and use, (50) N.J. 254.

paper on, (50) 844.

preparation, (46) Calif. 350.

progress in use of, (50) 658.

use, (47) Wis. 452.

use against cucumber beetles, (49) Wis. 760.

gas, evolution from carrying substances, (50) 254.

in tobacco seeds, (44) 201.

localization in tobacco, (45) 820.

oleate, insecticidal value, (44) Conn. State 858.

petroleum emulsion, insecticidal value, (49) 758.

poisoning, history, (48) 481.

preparations, analyses, N.J. (43) 37; (44) 440.

solutions, preparation, (46) U.S.D.A. 235.

solutions, strength of, (41) 754.

sulphate—

and Sulfoleum, (44) Mass. 453.

as ovicide and larvicide, (45) U.S.D.A. 151.

Nicotin—Continued.

sulphate—continued.

dust for truck crop insects, (44)

U.S.D.A. 651.

in dust carriers, (49) Wis. 653.

insecticidal value, (41) Ill. 146.

160; (43) Oreg. 756; (44) Mo.

856, Conn.State 858.

vermicidal value, (48) 882.

toxicity, relation to volatility, (50)

658.

use against oriental peach moth, (44)

254.

volatility from insecticide dusts, (49)

N.Y.State 551.

Niger, natural crosses of, (44) 429.

Night blindness due to lack of fat-soluble

A, (42) 462.

Night soil, fertilizing value, (41) 814; (45)

816.

Night temperature in orange groves, studies,

(42) 537

Nightshade, feeding experiments, (46) 674.

Nigrospora panici, notes, (41) 544.

Nile—

control, (48) 286.

deposits in Egypt, notes, (42) 420.

gauge readings and discharges, (44)

84.

Nipa palm, alcohol from, (47) 207.

Nipa palm, economic uses, (42) 142.

Nippon River fever, *see* Tsutsugamushi.

Nisotra breweri, notes, (41) 661.

Nisotra gemella, life history and habits,

(48) 359.

Niter cake—

for ammonia fixation, (41) 516.

production and sale in 1919, (44) 513.

Nitragin, inoculation of legumes with, (43)

217.

Nitrate—

and calcium cyanamid mixtures, total

nitrogen in, (48) 413.

Chilean, as source of potash, (43) 25.

content of soil as affected by various

crops, (41) N.Dak. 823.

content of water, (44) 483.

deposits, Chilean, origin, (50) 122.

deposits in California, (48) 425.

deposits of Amargosa Valley, (41) 323.

industry in United States, development,

(48) 120.

industry of Chile, (43) 728; (48) 621.

nitrogen, effect on wheat, (49) U.S.D.A.

829.

nitrogen removal from soil by drain-

age, (47) Ky. 122.

of ammonia, *see* Ammonium nitrate.of lime, *see* Calcium nitrate.of potash, *see* Potassium nitrate.of soda, *see* Sodium nitrate.

plants, Government, need for continu-

ous operation, (43) 25.

reduction test for bacteria, (42) N.Y.

State 325.

situation, Chilean, (50) 323.

Nitrate—Continued.

situation, congressional hearings, (49)

624.

Nitrates—

absorption and storage by *Amaranthus*,

(43) 225.

absorption by soils, (42) Calif. 811.

accumulation as affected by—

potassium salts, (44) N.Y.Cornell

818.

straw, (46) 423; (47) Wash. 212.

succulency of green manure, (46)

N.Y.Cornell 212.

sulphur, (49) Wash.Col. 215.

wheat straw, (46) 622.

accumulation—

from decomposition of oil cakes,

(46) 714.

in grassland as affected by phos-

phates, (49) 21.

in soil, difference in rate, (44)

Kans. 419.

in soils, excessive, (43) 216.

on limed and unlimed soils, (44)

19.

relation to soil condition, (46) 813.

under straw mulch, (48) 720.

amounts in first 5 feet of soil, (46)

515.

as affected by sewage organisms, (43)

791.

assimilation, rôle in oat dry spot, (49)

840.

composition and action, (46) 820.

determination, (41) 204.

determination—

effect of chlorids on, (42) 504.

improved method, (42) 414.

in plant tissue, (44) 504.

in soil, (44) 611; (49) 309.

in soil, variation, (48) 215.

disappearance from soil under timothy,

(49) 321.

effect on—

arsenic determination, (47) 503.

Azotobacter growth, (43) Pa. 514.

color of apples, (43) Oreg. 145.

nodule production, (44) 622.

plant and soil acidity, (47) 518.

soil solubility, (41) Mich. 512.

wheat, relation to time of applica-

tion, (47) 233.

fertilizing value, (50) Minn. 121.

fluctuation in Gangetic alluvium, (49)

322.

formation, (45) Colo. 118.

formation—

after clover and timothy, (43)

215.

as affected by cultivation, (47)

214, Ark. 724.

as affected by cultivation and weed

growth, (41) Kans. 33.

as affected by sulphur, (46) 428.

in soil, effect of time of year, (50)

17.

in soil, intensive, (42) 217.

Nitrates—Continued.

- from atmospheric nitrogen, (50) 722.
- in moor soils, origin, (44) 622.
- in orchard soil, determination, (43) Ind. 338.
- in soil at Pusa, movements, (50) 210.
- in soil, effect of straw, (49) Wash.Col. 209.
- in soil, relation to concentration of soil solution, (47) N.Mex. 417.
- leaching from soils, (49) 419.
- loss in uncropped land, (43) 19.
- movement in soils, (44) 813; (49) 119.
- nitrogen determination in, (43) 714; (49) 12.
- potential source, (49) 123.
- production, (42) 219; (44) 627.

- production—
 - after timothy and clover crops, (43) 215.
 - as affected by cropping and cultivation, Mo. (45) 215; (48) 616.
 - as affected by lime, (46) Mo. 315. 515.
 - factors affecting, (43) Ill. 214.
 - from catalytic oxidation of ammonia, (43) 816.
 - in soils, (41) Mo. 623; (43) Ill. 214, Mo. 722; (45) Ill. 214.
 - most active periods of, (43) Ill. 214.
 - relation to nitrogen removed by crops, (47) Tex. 23.
 - research on, (47) 421, 622.
 - reduction by seed, (49) 213.
 - relation to sod effect on apple trees, (49) N.Y.Cornell 235.
 - vertical distribution, (49) 210.

Nitric acid—

- effect on germination, (47) 523.
- nitrogen determination in, (49) 12.
- production, equipment for, (42) 522.

Nitric nitrogen—

- in soils, relation to concentration of soil solution, (49) N.Mex. 515.
- reducing methods, (45) 504.

Nitrification—

- as affected by—
 - alkali salts, (43) 216.
 - aluminum salts, (47) 122.
 - crop residues, (42) 18.
 - fertilizers, (46) 121.
 - gypsum, (49) 727.
 - moisture in soil, (45) 725.
 - organic matter and lime, (41) 319.
 - oxidation of sulphur, (42) 429.
 - permutit, (45) 621.
 - phosphates, (41) 721.
 - potassium fertilizers, (50) 818.
 - sodium salts, (41) 320.
 - soil moisture, (43) Wash. 722.
 - sulphur oxidation, (50) 726.
 - time of year, (43) 124.
 - tree products, (47) 812.
 - water in soil, (47) 724.
- as criterion of fertility, (41) 321.
- effect of temperature, (50) 516.

Nitrification—Continued.

- effect on rock phosphate, (41) 324.
- effect on soil constituents, (41) 324.
- experiments with U-cultures, (45) 329.
- factors affecting, (49) 210.
- in acid soils, (45) Iowa 117.
- in bhatta soils, (41) 812.
- in California soils, studies, (42) Calif. 811.
- in Egyptian soils, (41) 812.
- in embanked wheat soils of India, (41) 811.
- in moor soils, (41) 212.
- in muck soils, (50) N.C. 320.
- in natural soils, (41) 125.
- in Porto Rico soils, (44) 814.
- in semiarid soils, (43) 215.
- in soils, (45) 809.
- in soils, velocity of, (43) Pa. 515.
- in South African soils, (46) 514.
- in Sudan soils, (50) 816.
- in Texas soils, (43) Tex. 724.
- in tropical soils, (47) 214.
- in wheat seed bed, (41) Kans. 33.
- measure of antagonistic action, (44) 20.
- methods of study, (50) 118.
- natural, in soils, (44) 814.
- nature of, (49) 419.
- notes, (44) Kans. 214.
- of ammonium sulphate, (43) 215.
- of bone meal, (43) 215.
- of drained marsh soil, studies, (47) 512.
- of dried blood, (43) 215.
- of Egyptian soils, (44) 813.
- of leather, (41) 517.
- of manure in cultivated soil, (42) 519.
- of oil cake, (41) 517, 816.
- relation to nitrogen removed by crops, (47) Tex. 22.
- relation to pH value, (50) 722.
- solvent action of, (46) Ohio 428.
- studies, (41) 421, 623, 720; (42) 217; (44) 622; (47) 21; (50) 320.

Nitrifying bacteria—

- isolation and studies, (43) 216.
- relation to reactions and concentrations of media, (50) 516.

Nitrite—

- ferment, carbon nad nitrogen relations, (47) 21.
- ferment, isolation and description, (47) 21.
- fertilizer experiments, (48) 820.
- formation in solution, (41) 623.
- nitrogen determination in presence of nitrates, (48) 109.

Nitrites—

- carbazol test for, (43) 316.
- determination, (41) 204.
- determination in corned beef, (42) 711.
- determination in plant tissue, (44) 504.
- effect on arsenic determination, (47) 503.
- in diseased plants, (42) 144.
- in moor soils, origin, (44) 622.

Nitrobacter—

- effect of organic nitrogenous compounds, (45) 515.
- soil vaccine, tests, (45) 810.

Nitrobenzene—

- effect on plants, (46) 544.
- toxicity, (41) N.Y.Cornell 82.

Nitrobenzol in benzaldehyde, detecting, (47) 611.

Nitrocellulose—

- explosives, colloid chemistry, (41) 801.
- from wood pulp, (41) 14.
- use in agriculture, (45) 891.

Nitrogen—

- absorption by peat, (41) 722.
- absorption from whole wheat bread, (44) 167.
- accumulation and utilization, (42) N.J 812.
- accumulation in soil, rate, (46) Mo. 315.
- action of hexamethylenetetramin, (49) 123.
- amid, from gliadin, (44) 308.
- amino, determination, (49) 714.
- amino, free, in proteins, (49) 715.
- amino, in cream and butter, (48) 206.
- amino acid, in blood, determination, (47) 410.
- amino acid, in gastric residuum, (41) 764.
- amino acid, in urine, determination, (47) 410.
- ammoniacal, method of determining, (50) 9.
- and calcium relation in plants, (50) 524.
- and hydrogen mixture, preparation, (43) 220.
- applications, effect on set of apples, (50) 299.
- assimilation—
 - as affected by sulphates, (41) 427.
 - by corn, (45) 628.
 - relation to cellulose decomposition, (41) 632.
- atmospheric—
 - biological fixation, (49) 119.
 - fertilizers, test, (50) U.S.D.A. 621.
 - fixation, (48) 23.
 - fixation and use, treatise, (48) 425.
 - fixation by activated sludge, (50) 323.
 - fixation by wheat, (48) 725.
 - nitrates and ammonia from, (50) 722.
 - solution by water, (41) 321.
 - utilization by yeast, (49) 819.
 - utilization in agriculture, (42) 520.
- availability—
 - in soil, factors affecting rate, (49) Mont. 116.
 - in soils, variation, (48) 215.
 - in various fertilizers, (43) Ala. Col. 135.

Nitrogen—Continued.

- available on the farm, (45) Mich. 698.
- bacteria fertilizers, value of, (43) 221.
- balance of soil, studies, (47) 25.
- compounds from wool scouring wastes, (47) 324.
- compounds, production in Germany, (41) 424.
- deficiency in German soils, (42) 515.
- derivatives in plants, formation, (48) 221.
- determination, (41) 504, 803; (43) 116; (44) 801, 804; (45) 206; (48) 10.
- determination—
 - continuous process, (42) 313.
 - in blood, (41) 13, 116, 617; (43) 205; (46) 615.
 - in fertilizers, (41) 228.
 - in nitrates and fertilizers, (43) 714.
 - in nitrates and nitric acid, (49) 12.
 - in nitrites, (48) 110.
 - in oils, (41) 711.
 - in plant tissue extracts, (49) 309.
 - in soil, (41) 124, 411.
 - in urine, (41) 414; (44) 804; (45) 611; (46) 615.
 - methods, (42) 205, 802; (43) 13, 316; (47) 309, 310, 503.
 - new accelerator for, (48) 313.
 - of active value in soil, (47) 24.
 - use of perchloric acid in, (46) 615.
 - use of persulphate in, (49) 111.
- distribution—
 - determination, (41) 712.
 - in alfalfa seed, (45) 501.
 - in beef tissue, (48) Mo. 608.
 - in meat extracts, (46) 12.
 - in plants, (42) 229.
 - in soils, studies, (43) 18.
 - in urine, (47) 564.
 - of proteins, (47) 201.
- effect of time of application on cereals, (44) Calif. 723.
- effect on—
 - cereals, (48) R.I. 518.
 - meadows, (50) 434.
 - oats at different growth periods, (49) 132.
 - potassium absorption, (47) Calif. 625.
 - protein content and yield of wheat, (47) Idaho 636.
 - "sick" soils, (50) 521.
 - wheat, (48) 633.
- elimination, rate, (45) 862.
- equilibrium and carbohydrates, (45) 568.
- equilibrium and vitamin deficiency, (45) 567.
- expenditure, minimum, of man, (47) 765.
- fertilization, (46) 424.

Nitrogen—Continued.

fertilization—

- and cultivation, (47) 214.
- effect on insoluble phosphates, (47) 817.
- experiment, (45) 623.
- experiments on pastures, (50) 122.
- with liquid manure drill, (47) 726.

fixation—

- and utilization, (48) 519.
- arc process for, (50) 722.
- as criterion of fertility, (41) 321.
- at different soil depths, (42) 425.
- atmospheric, treatise, (47) 320.
- by algae, (46) 824, 825.
- by *Azotobacter*, effect of pH value, (48) 719.
- by *Azotobacter*, studies, (42) Calif. 812.
- by Bucher process, experiments, (42) 124.
- by *Clostridium pastorianum*, (48) 516.
- by electric arc, (42) 312; (43) 323.
- by green plants, (43) 430; (46) 723.
- by inoculated soy beans, (46) 19.
- by nodule bacteria, energy requirements for, (49) 812.
- by nonsymbiotic soil bacteria, (42) 18.
- cyanid process, (48) 23.
- effect of calcium carbonate, (49) 515.
- effect of carbohydrate material, (48) Calif. 517.
- effect of colored light, (47) 31.
- effect of fertilizers, (46) 120.
- effect of humus, (46) 715; (50) 120.
- effect of magnesian limestone, (50) 219.
- effect of salts, (47) 517.
- effect of sodium salts, (41) 320.
- effect of straw, (46) 424.
- effect of tree products on soil, (49) Idaho 213.
- effect of uranium salts, (45) 810.
- effect of wood and forest products, (45) Idaho 212.
- experiments with U-cultures, (45) 329.
- factors affecting, (49) 18.
- fertilizers from, (41) 423; (42) 722.
- furnaces, comparison, (42) 328.
- in arid climates, (48) 320.
- in Colorado soils, (47) Colo. 622.
- in *Ericaceae*, (49) 522.
- in Germany, before and after the war, (43) 426.
- in soils, (45) Colo. 117.
- nonsymbiotic, (41) 125, 721.

Nitrogen—Continued.

fixation—continued.

- processes, (41) 22, 111, 131, 218; (42) 219, 623; (43) 219, U.S.D.A. 426, 627; (44) 128; (45) 518; (46) 820.
- relation to soil acidity, (49) Kans. 414.
- research on, (50) 721.
- role of microorganisms in, (42) 514.
- studies, (44) 622; (47) 627; (49) 117, 118; (50) 210.
- symbiotic, (48) 27.
- symbiotic and nonsymbiotic, (47) 213.
- symbiotic, by legumes, (46) 514.
- symbiotic, relation to soil nitrogen, (43) 625.
- treatise, (42) 22.
- velocity, (44) Pa. 723.
- fixed inorganic, production and consumption, (41) 22.
- fixing bacillus, new, (49) 213.
- fixing powers of soil, factors affecting, (50) Utah 119.
- forms in soy bean nodules, (46) 630.
- from the air, (44) S.Dak. 511.
- gasometric determination, (45) 11, 804.
- generator, description, (42) 205.
- in alfalfa hay, (47) 10.
- in barley, factors affecting, (50) 233.
- in blood of avitaminous and starving pigeons, (50) 565.
- in blood, variability, (43) 265.
- in cacao soils as affected by shading, (41) 213.
- in cottonseed meal, availability, (47) Tex. 217.
- in crops, effect of fallow v. manure, (47) 25.
- in crops, effect of soils and fertilizers, (41) 422, 813.
- in egg albumin as affected by quinin, (44) 566.
- in field soils, variations, (41) 124.
- in flax, factors affecting, (48) 720.
- in high-altitude grasses, (41) Wyo. 333.
- in human excreta, (44) 215.
- in irrigation water, (48) 118.
- in manure, preservation, (47) N.Y.State 516.
- in muck, availability, (46) 120.
- in oats as affected by fertilizers, (43) 322.
- in organic compounds, detection, (46) 415.
- in organic matter, determination, (44) 805.
- in peas, effect of inoculation, (48) 836.
- in rain, (44) 811; (47) 213.
- in rain and snow, (41) Can. 510, 620; (48) 114; (50) 716.
- in sewage tanks, origin, (50) 791.

Nitrogen—Continued.

in soil—

- and chlorin index, relation, (48) 516.
- effect of cultivation and fertilization, (43) Ohio 725.
- effect of fallow v. manure, (47) 25.
- effect of farming system, (48) 218.
- effect of Kafir corn, (41) Kans. 34.
- effect of lime, (44) Va. 723; (46) 425.
- effect of straw and sugar, (42) 425.
- effect of various salts, (41) 326.
- factors affecting, (44) 126; (49) N.Y. Cornell 117.
- income and outgo, (47) 213.
- in soils of Greece, (47) 121.
- in wheat, factors affecting, (48) 720.
- inorganic, consumption and supply in United States, (43) 425.
- inorganic, demand in United States, (43) 24.
- inorganic, supply in United States, (43) 24, 426.
- Kjeldahl determination, (45) 613.
- legume v. commercial, (44) 22.
- lime, *see* Calcium cyanamid.
- losses, experiments, (42) 124.
- losses from corn silage, (45) U.S.D.A. 266.
- losses from liquid manure, prevention, (43) 323; (46) 714.
- losses from manure, (47) 515.
- losses from manure, prevention, (48) N.Y.State 20, N.Y.State 21, 217.
- losses from manure, urine, etc., cause, (50) 421.
- losses from organic matter, cause, (45) 424.
- losses from soil, (42) 124; (50) Pa. 422.
- losses from soil by drainage, (43) 19.
- losses from urine, prevention, (42) 428.
- losses under intensive cropping, (45) 810.
- manufacture, (43) 627.
- metabolism—
 - during single and fractional feedings, (48), 562.
 - formation of soluble starch in, (43) 525.
 - in Singapore, (44) 763.
 - of actinomycetes, (43) 634.
 - of cows, (43) 270; (45) 71; (47) 77.
 - of leaves, (43) 729.
 - of pigs fed corn meal and milk, (44) 175.
- microdetermination, (46) 12, 709.
- mineral and organic sources, (48) 218.
- movement in soils, (41) 214.
- need and use by plants, (46) 224.
- nitrate and organic, relative availability, (41) 627; (43) 220.
- nonprotein, determination, (46) 113.

Nitrogen—Continued.

- nonprotein, in goat's milk, (49) 175.
 - nonprotein, of blood, (43) 265, 266, 463; (45) 382; (48) 860.
 - nonprotein, use in feeding stuffs, (48) 771.
 - of liquid manure, studies, (41) 721.
 - organic, decomposition in rice soils, (50) 815.
 - organic, in fertilizers, measurement, (48) 609.
 - partition in urine of races in Singapore, (43) 65.
 - pentoxid, decomposition, (45) 310.
 - present and future supplies, (48) 218.
 - production, (47) 420.
 - production of world, (45) 518.
 - Products Committee, British, report, (43) 218.
 - Products Committee report, supplement, (46) 425.
 - recovery from sewage, (50) 124.
 - relation to crop production, (48) 120.
 - removed by crops, (47) Tex. 22.
 - requirements of man, value of gelatin in, (47) 563.
 - stable manure, nitrification of, (42) 519.
 - starvation, by bacterial reduction of nitrates, (42) 145.
 - studies, data, (49) Oreg. 510.
 - supply and Muscle Shoals plant, (48) 120.
 - transformation in sand soils, (45) 726.
 - treatment of soil, effects, (50) 624.
 - water-insoluble, in fertilizers, analyses, (42) R.I. 523.
 - world's supply, control of, (43) 323.
- Nitrogenous—
- compounds, manufacture, (45) 120.
 - compounds, organic, availability, (48) 821.
 - compounds, utilization in bacterial nutrition, (41) 264.
 - constituents of feeding stuffs, (41) 367.
 - constituents of tobacco seeds, (44) 201.
 - fertilizer, Rehmsdorf organic, tests, (50) 623.
- fertilizers—
- action in soils, (45) 725.
 - amount on winter grain, (48) 520.
 - availability, (41) N.J. 22.
 - comparison, (41) Mass. 21, 22, 218, 229, 424, Can. 516, 723, 814, 815, 825; (42) 624, 721, Calif. 811; (43) 221, 232, N.C. 427, 627, La. 627, Can. 727; (44) R.I. 21, 128, 214, 216, 318, 421, 513, 514, 614, Oreg. 836; (45) 518; (46) 120, 625, S.C. 717; (47) 321, 322; (48) S.C. 621, 820; (49) 19, 20.
 - development, (46) 124.
 - effect of time of application, (50) 623.

Nitrogenous—Continued.

fertilizers—continued.

effect on alkaloid content of lupines, (48) 622.

effect on chlorosis in rice, (49) 754.

for apples, (47) Mo. 141.

for apples, time of application, (48) 236.

for corn and wheat, (41) Del. 136.

for orchards, (41) Mo. 649, Mo. 650; (46) Wash. 817.

for sugar cane, (48) 230.

for tobacco, tests, (46) 638.

from sugar cane megass, (44) 513.

hygroscopicity, (47) 321.

in France, (49) 214.

in German agriculture, use, (50) 423.

laws in Germany, (43) 221.

manufacture, (42) 722.

mineral v. organic, (41) N.C. 624.

mining and manufacture, (41) 423.

new, (48) 517, 721, 820.

new German, (44) 216.

nitrifiability, (46) 516.

on legume crops, (47) 816.

organic-cake, bacterial transformation, (41) 816.

organic-cake, relative nitrifiability, (49) 122.

physiologically acid and alkaline, action, (50) 423.

residual effect, (41) N.C. 625.

synthetic, (42) 623, 814; (45) 518.

tests in Germany, (47) 419.

time and kind of application, (49) 623.

time of application, (49) 517.

use in India, (41) 323.

world's supply, (41) 424.

material, formation in leaves, (44) 825.

potassic fertilizers, preparation from explosives, (46) 626.

refuse, utilization, (41) 723.

salts, effect on quality of potatoes, (46) 441.

salts, effect on rice yields, (44) 830.

salts, new, fertilizer experiments, (45) 330.

Nitrometer method of determining nitrogen, (49) 12.

Nitrosococcus sp., isolation and description, (47) 21.

Nitzschia closterium, synthesis of vitamin A by, (47) 769.

Nocard's bacillus and acne bacillus, comparison, (48) 879.

Noctua—

c-nigrum, life history notes, (50) Mass. 659.

fennica, notes, (45) Mich. 251.

fractilinea, notes, (41) Mich. 660.

Noctuid—

moth, control, (41) 339; (47) 851.

new, from Arizona, (42) 652.

Noctuidae, physical ecology of, (49) Minn. 758.

Nodular peribronchitis of the horse, parasite of, (47) 589.

Nodule bacteria—*see also* *Bacillus radicicola*.

adaptation to nonlegumes, (44) 221. and chloroplasts, morphogenesis, (49) 819.

destruction by digestion, (42) Wis. 325.

development, (47) 329.

effect of acid soils, (49) 619.

effect of seed germination on, (41) 735; (42) 25.

effect of sulphates, (41) 427.

effect of sunlight on longevity, (49) Wash.Col. 223.

effect of winter temperatures, (45) Wis. 214.

energy requirements for nitrogen fixation by, (49) 812.

flagellation of, (42) 434; (43) 433.

grouping, (49) Wis. 626.

longevity, (44) Wis. 227; (48) Mo. 616.

of Casuarina, studies, (44) 521.

of *Datisca cannabina*, (44) 630.

studies, (47) 729, Ill. 814; (49) 30.

Nodule—

formation—

as affected by pH, (47) 434.

by soy beans, (49) 35.

in drained marsh soil, (47) 512.

in indigo, (48) 732.

organisms, life cycle, (46) 124.

production—

as affected by acidity, (45) Wis. 213.

effect of soil temperature, (46) 124.

in bhatta soils, (41) 812.

in soil, (45) Colo. 213.

notes, (41) 522; (43) 30.

of alfalfa, (44) 634.

relation of nitrates to, (44) 622.

Nodules, forms of nitrogen in, (46) 630.

Nodulicoccus, new genus, erection, (49) 851.

Nomenclature of agricultural plants, (46) 129.

Nomogram for calculating area of human body, (47) 165.

Nomography, theory, (50) 586.

Nonagria oblonga, studies, (46) N.Y.Cornell 465.

Nondisjunction, high and low, in *Drosophila*, (50) 730.

Nonpartisan League, development, (44) 791.

Nonpartisan League, treatise, (46) 292.

Noodles, nutritive value, (42) 457.

Norit—

- adsorbent power compared with blood charcoal, (45) 15.
- decolorizing carbon, production, (44) 808.
- for sugar refining, (47) 206.
- recovery, filter for, (44) 808.

Normal Rural Home Economics Institute.
course of study in, (47) 695.

North Carolina—

- College, notes, (42) 94, 499; (43) 399; (44) 97, 700; (47) 400; (49) 99, 497; (50) 699.
- Station, notes, (42) 499; (47) 400; (49) 497; (50) 699.
- Station, report, (41) 699; (43) 496; (45) 496; (47) 599; (49) 798.

North Dakota—

- College, notes, (41) 399, 499; (42) 94; (43) 900; (45) 300, 499; (47) 699; (49) 900.

Dickinson Substation, report, (42) 796; (44) 95; (48) 298.

Edgeley Substation, report, (45) 298; (48) 97.

Hettinger Substation, report, (41) 897; (45) 799.

State demonstration farms, report, (45) 299; (48) 298.

Station, notes, (41) 399; (42) 94; (43) 900; (44) 299, 899; (45) 98; (46) 700; (47) 699; (49) 497.

Station, report, (41) 198; (43) 397; (44) 598.

Station, report of director, (45) 298; (48) 97.

Williston Substation, report, (48) 298.

Northeastern Forest Research Council, organization, (50) 700.

Northwest Wheat Growers' Association, (44) 691.

Nosema apis—

- diagnosis, (41) 667.
- in hive bees, (43) 59.
- infection, pathological conditions, (50) Minn. 156, 561.
- notes, (44) 856; (46) U.S.D.A. 858.
- relation to Isle of Wight disease, (47) 557.
- summary, (50) 260.

Nosema baetis n.sp., notes, (47) 257.

Nosema bombycis, studies, (45) 554.

Nosema disease of bees, (41) U.S.D.A. 359.

Notaris puncticollis, studies, (46) N.Y.Cornell 465.

Notodontidae—

- new species, (45) 255.
- of Japan, revision, (48) 553.

Notoedres alenis, remedy, (45) 387.

Nozzles, hydraulic experiments with, (42) 79.

Nuclear bodies, nature and behavior, (43) 524.

Nuclei, morphological studies, (50) 225.

Nucleic acid—

- effect on plant growth, (43) 514; (49) 815.
- properties and action, (45) 203.

Nuclein decomposition, factors affecting, (50) 720.

Nucleoli, biological significance, (42) 727.

Nucleoprotein injection, effect on milk secretion, (42) 672.

Nucleus of leaf cells as center of oxidation, (41) 221.

Nummularia discreta, notes, (41) 347; (44) 847; (45) N.Y.State 652; (47) Ill. 449; (49) Iowa 747.

Nun-moth increase, (45) 656.

Nun-moth, outbreak, studies, (45) 554.

Nurseries, damping-off in, control, (45) U.S.D.A. 357.

Nursery—

- and seed bed problems, (48) 443.
- belts in prairie regions of Iowa, (48) 448.

conditions in western Europe, (47) 552.

insects in New Jersey, (41) 549.

insects, notes, (44) 351.

inspection, (43) 237; (44) 249, 351.

inspection, Conn.State (41) 158; (43) 251; (47) 155; (50) 50.

inspection—

in Illinois, (41) 835.

in New Jersey, (41) 443.

in West Virginia, reports, (42) 356.

law of South Dakota, (41) 58; (47) 848.

standardized, (45) 253.

work in Kansas, (49) 251.

manual, revision, (42) 534.

pests, summary of information, (42) 748.

practice, revolutionizing, (49) 42.

seed beds, weed eradication, (48) 240.

small, establishment, treatise, (50) 540.

stock—

coniferous, snow molding in, (49) 755.

crown gall, studies, (41) Iowa 238, Iowa 249, 545, 750.

dipping and fumigation, (44) Mo. 856.

eradication of blotch from, (49) Ind. 755.

imported, insects on, (41) 251; (43) 352; (46) 748; (47) 552.

imported, inspection, (45) Conn. State 148.

insects injurious to, (45) Mo. 252.

nematodes affecting, (43) 350.

northern v. southern, (45) N.Dak. 240.

Pythiacystis citrophthora on, (47) Calif. 649.

quality in, (48) 837.

regulations, (44) Mo. 638, 836.

selection, (43) Ohio 339.

snow smothered, molding, (43) 846.

uniformity of fumigation requirements, (49) 352.

Nursery—Continued.

trials, experimental error in, control,
(48) 195; (50) 229.

Nusa, Nearctic, notes, (41) 62.

Nut—

grass scale, notes, (47) 253.

industry, American, (42) 737; (43)
240.

industry in Italy, (43) 438.

industry in Spain, (42) 641.

margarin, digestion by children, (42)
61.

margarins, inspection and analyses,
(41) Conn.State 170.

oil, hydrogenation, (50) 309.

Nutmeg lumber, value, (48) Calif. 541.

Nutmeg seeds, germination, (48) Calif. 540.

Nutrient—

agar for rearing dipterous larvae, (48)
358.

media, *see* Culture media.

solution of von der Crone, evaluation,
(42) 131.

solutions—

absorption by plants, (50) 524.

and pH, effect on plant growth,
(44) 28.

as affected by added solids, (41)
133.

as affected by adsorbing surfaces,
(41) 422.

as affected by sand, (43) 210.

at minimum concentration, root
absorption from, (41) 132.

complete, studies, (48) Calif. 523.

concentration and reaction as af-
fected by fineness of sand, (44)
N.J. 325.

culture tests, (48) 727.

effect of concentration on plants,
(43) 523.

for maize, (41) 820.

for plants, continuous renewal,
(47) 127.

optimum for plants, (44) 324.

pH value as affected by wheat
seedlings, (49) 627.

physiological balance in, (49) 519.

rate of change in pH, factors af-
fecting, N.J. (48) 326, 327.

reaction, relation of plants to,
(42) 24; (44) 324; (46) N.J.
525.

relation to composition of cell sap,
(43) 224.

three-salt, H-ion concentration,
(44) 621.

use of iron in, (41) 430.

Nutrients, absorption by crops, (48) 18.

Nutrition—

activities in Massachusetts, (45) 61.

amino acids in, (44) 462; (45) 864;
(47) 365, 660.

and clinical dietetics, treatise, (50)
762.

and food chemistry, (46) 355.

Nutrition—Continued.

and growth of children, (48) 654.

and growth on fat-free diet, (46) 565.

and health, suggestions, (49) Ark. 364.

and physical efficiency, (43) 365.

and public health, (44) 62.

and vitamins, (46) 256, 257.

and vitamins, treatise, (47) 768.

animal, *see* Animal nutrition.

as affected by vitamin B, (44) 860.

bacterial, studies, (50) 184, 879.

bibliography, (46) 295.

chemistry of, (46) 255.

class program, evolution, (47) 898.

classes, food lessons for, (48) 896.

classes for undernourished children,
(44) 666.

classes in New York City, (48) 692.

classes, outline, (45) 697.

clinics and classes, (43) 167.

cooperative course in, (50) 797.

diseases of and infant feeding, (42)
660.

during childhood, (42) 658.

during mental work, (49) 561.

effect of underfeeding on steers, (44)
570.

effect on diazo value of urine, (43)
368.

elementary, teaching, (45) 899.

experimental work on, (42) 58.

experiments, (45) Okla. 465.

experiments, animal, (49) Iowa 772.

experiments with rats, technique, (44)
462.

fat-protein ratio in, (41) 669.

for undernourished children, (45) 63.

function of lymphocyte and lymphoid
tissue in, (46) 867.

handbook, (50) 597.

human, extension program in, (50)
U.S.D.A. 695.

human, treatise, (43) 261.

in extreme inanition, (44) 863.

in Germany during the war, (43) 459.

in infancy, pathology, (45) 263; (47)
482.

in sports, (48) 258.

in Vienna, (46) 669.

index, height and weight measurements,
(48) 362; (49) 257-

indexes, review of literature, (47) 166.

indexes, use of weight-height-age tables,
(50) 853.

influence of immunity production, (41)
574.

laboratory of Carnegie Institution, re-
port, (43) 66, 266; (45) 161; (47)
164; (49) 256.

law of minimum in, (46) 756.

modern science of, (49) 762.

newer knowledge of, (47) 363; (48)
257, 857.

of children, standards, (50) 460.

of children, treatise, (47) 766.

of infants, rôle of vitamins in, (43)
663.

Nutrition—Continued.

- of man and animals, research center for, (48) 857.
- of pigeons, (49) 160.
- of poorer classes in Vienna, (45) 562.
- of rural child, (44) 393.
- of the dog, relation to vitamin B, (46) 358.
- of the rat, accessory factors in, (41) 171.
- of working class in Glasgow, (47) 263.
- on fat-free diets, (44) 666.
- on high protein dietaries, (48) 560.
- papers on, (44) 859.
- Pirquet system, (44) 559; (47) 764.
- Pirquet system applied to American conditions, (46) 562.
- Pirquet system critique, (49) 856.
- Pirquet system, treatise, (48) 462.
- plant, *see* Plant nutrition.
- present standards, (47) 164.
- problems, discussion, (42) 164, 365, 456.
- project, local leadership in, (49) 596.
- quality of protein in, (46) 255.
- reduction of standard ration, (41) 854.
- relation to food manufacture, (46) 256.
- relation to tooth development, (48) 465.
- relative protein-sparing action of carbohydrates and fats in, (49) 362.
- rôle of calcium in, (43) N.Y.State 574.
- rôle of cystin in, (42) 756.
- rôle of fats in, (45) 865.
- rôle of various food constituents in, (41) 670.
- rôle of vitamin B in, (49) 62.
- rôle of vitamins in, (45) 867.
- science of, treatise, (50) 852.
- small amounts of chemicals in, (45) 665.
- standards of adolescence, (41) 669.
- standards, recent conceptions, (45) 164.
- studies, (43) 763; (46) 564, 758; (47) 461.
- studies in Russia during famine, (50) 561.
- studies with swine, (46) Kans. 475.
- studies with tadpoles, (41) 468.
- teaching, (50) 597.
- use of proteins in, (49) 158.
- work among Italians, (48) 160.
- work in schools of New York State, (45) 61.

Nutrose, substitute for, (42) 463.

Nuts—

- analysis, (44) 412.
- as source of vitamin A, (44) 765.
- Chinese, collected by Meyer, (41) 742.
- copper determination in, (44) 62.
- culture, (41) 339; (43) Mich. 649.
- culture and expression of oil, (43) 240.
- culture and variety tests, (41) N.Mex. 147.

Nuts—Continued.

- culture experiments, (43) Md. 143, U.S. D.A. 339.
- culture in British Columbia, (46) Can. 140.
- culture in China, (45) 643.
- culture, treatise, (44) 41.
- growing in Michigan, (45) 441.
- growing in United States, (45) 441.
- growing, treatise, (46) 40.
- new, characteristics, (47) 340.
- nutritive value, (47) 60.
- protein content, (44) 461.
- standards for, (44) 413.
- stocks for grafts, control of sap flow in, (42) 737.
- varieties, (41) 837.
- variety tests, (43) U.S.D.A. 339.
- water-soluble vitamin content, (44) 461.
- wild, of Philippines, (45) 821.
- Nuttallia equi, notes, (42) 178; (43) 83.
- Nuttalliosis—
 - distribution, (48) 182.
 - drug treatment, (44) 82.
- Nymphs and adults, hard shell, control, (49) 152.
- Nymphula—
 - depunctalis on rice, (42) 451.
 - sp., aquatic caterpillar of, (49) 53.
- Nysius—
 - ericae, notes, (41) Mont. 57.
 - vinitor, notes, (44) 653; (49) 758.
- Nyssoninae, new species, descriptions, (46) 160.
- Oak—
 - American white, hemicellulose of, (50) 311.
 - aphids, (42) 155.
 - chestnut, use for paving, (44) 285.
 - cork, culture in Spain, (50) 40.
 - cork, in Tunis, (50) 744.
 - diseases, notes, (41) 752; (43) 754.
 - fuel value, (48) 783.
 - fungus disease, (44) 451.
 - leaf miners, notes, (41) 555; (44) 352.
 - leaves and twigs, feeding value, (45) 774.
 - leaves, deformation, studies, (45) 55.
 - mildew, control, (41) 659.
 - mildew, effect on seedlings, (43) 241.
 - mildew infecting beech in British Isles, (42) 747.
 - mildew, studies, (49) 446.
 - Oïdium, ascophore form, (44) 347; (47) 541.
 - Oïdium in Brazil, (44) 651.
 - Oïdium in France, (45) 753.
 - poisoning and hemorrhagic septicemia, (48) 482.
 - poisoning of livestock, (41) U.S.D.A. 191.
 - poisoning of livestock, control, (42) 879.
 - root fungus, new hosts of, (44) 545.
 - sapling borer, studies, (50) 662.

Oak—Continued.

- seedlings, hardiness in, (48) 233.
- silver-leaf, notes, (49) 845.
- tanbark, analyses, (48) 416.
- tree hopper, notes, (41) Fla. 548.
- twig girdler, notes, (44) 553.
- twig girdler, remedies, (42) Minn. 848.
- white, distillation, (47) 208.
- white, use for paving, (44) 285.
- worm, California, control, (41) 258, 662; (42) U.S.D.A. 853.

Oaks—

- as affected by sodium chlorid, (43) 344.
- breeding experiments, (43) 536; (49) Tex. 435.
- deciduous, of northern Africa, (46) 42.
- durmast, in British Isles, (46) 142.
- for ornamental planting, (45) 539.
- fungi attacking, (44) Conn.State 150.
- growth rings as affected by rainfall, (46) Mo. 16.
- in Ozarks, growth, (45) Mo. 838.
- natural regeneration, cause of failure, (43) 241.
- pruning experiments, (45) 645.
- ray structure and wound reaction, (48) 525.

Stereum gaussapatum on, (43) 449.

Oasis of Laghouat, Sabarian, (48) 493.

Oat—

- and pea hay, rotation experiments, (50) R.I. 520.
- anthracnose, relation to soils, (45) 49.
- aphid, control, (48) N.J. 354.
- aphids, studies, (41) N.J. 255, N.Y. Cornell 849.
- black rust, life history, (46) 240.
- black rust, notes, (50) 548.
- blade blight, resistant varieties, (50) 246.
- chops, analyses, (46) Tex. 675; (47) Ind. 473.
- crown rust, alternate hosts, (47) Iowa 542.
- crown rust, biologic forms, (43) 653.
- crown rust, dissemination, (50) U.S.D.A. 43.
- crown rust, infection capabilities, (50) 548.
- crown rust, notes, (46) 240; (47) Iowa 749; (50) 548.
- crown rust, resistance, (44) Mo. 747.
- crown rust, studies, (48) 845; (49) Ga. 541; (50) 746.
- disease survey in India, (46) 544.
- diseases, (45) 444.
- diseases, control, (43) Tex. 845.
- dry spot, cause, (49) 840.
- dry spot, studies, (44) 49; (47) 542.
- feed, analyses, (41) N.H. 68, Can. 564; (42) 263, Mass. 866; (44) Mass. 671; (46) N.H. 675; (47) Mass. 274, 275.
- flour, analyses, (42) Ind. 769; (48) Can. 368.

Oat—Continued.

- foot-rot disease in Northwest, (42) 351.
- Fusarium disease, (43) 751; (44) 243.
- grass as forage crop, (44) Utah 525.
- grass, downy, analyses, (41) Wyo. 333.
- grass, duration in meadows, (50) N.Y. Cornell 231.
- grass, tall, culture experiments, (43) Wash. 436.
- grass, tall meadow, (41) Idaho 225.
- groats, analyses, (47) N.J. 571.
- halo blight, notes, (43) 545; (50) 548.
- hay, culture, (49) Alaska 491.
- hay, feeding value, Calif. (44) 776; (47) 668, 673.
- hay, rotation systems for, (48) 529.
- hay v. alfalfa hay for calves, (42, Calif. 874.
- hay, yields, (45) Miss. 223.
- hull clippings, digestibility and productive value, (47) Tex. 472.
- hulls—
 - acetone and alcohol from, (48) 713.
 - analyses, (41) N.H. 68, Can. 564, Ind. 564, N.Y.State 868; (43) Vt 464, N.J. 672, R.I. 672; (44) Mich. 568; N.H. 671; (45) N.Y.State 469, 872; (48) Me. 68.
 - as hay substitute, (46), 674.
 - digestibility, effect of sodium hydrate, (47) 70.
 - digestion coefficients, (42) 263.
 - ground, analyses, (42) Tex. 769; (48) 68.
 - use in feeding stuffs, (50) 367.
- hybrids, inheritance of characters, (45) 822.
- leaves, injury due to nitrate assimilation, (49) 840.
- loose smut, control, (50) 347.
- loose smut infection, relation to soil factors, (49) 749.
- loose smut, notes, (50) 548.
- middlings, analyses, (41) Ind. 564, Ind. 868; (42) Ind. 769; (48) 68.
- mildew, studies, (41) Mo. 654; (50) 548.
- pasture, hogging down, (49) La. 271.
- plant composition, (47) 31.
- plant, phosphorus content, (45) Ohio 118.
- powdery mildew, resistance, (44) Mo. 747.
- products, analyses, (47) N.Y.State 172.
- products, deficiencies of, (42) Wis. 371.
- protein, efficiency, (41) 763.
- protein, nutritive value, (42) 459, 755.
- rations, effect on reproduction in cattle, (44) Wis. 672.
- rust, relation to barberry, (42) 542.
- rust resistance, inheritance, (42) 543; (46) 545.

Oat—Continued.

- rust resistant varieties, (41) Iowa 227; (46) Iowa 144; (47) Minn. 331; (48) N.Dak. 439.
- rust, studies, Iowa, (41) 49; (43) 654; (44) 444; (46) 342.
- rust, studies, (42) Mo. 654.
- rust, varietal susceptibility, (45) 747.
- scab organism, production of conidia, (43) 545.
- seedling blight, cause, (50) 648.
- shorts, analyses, (43) Ind. 867.
- sickness, (48) 347.
- smut—*see also* Smut and Cereal smut.
 - control, (42) 644, Mich. 694, 742, Ill. 844; (44) 150, Oreg. 841; (45) 49, Idaho 241, 444; (46) 844; (48) 47, Del. 643, 645; (49) Okla. 542, 645; (50) 245, Pa. 446, Can. 447, 549, 648, 649.
 - covered, control, (49) Wash.Col. 241.
 - notes, (41) 747; (43) 445; (46) 239, 240.
 - studies, (41) Mo. 654; (43) Wash. 750.
 - varietal infection, (44) 151.
- smuts, distribution in Washington, (44) 151.
- smuts, varietal resistance, (44) Mo. 747.
- sprouter, (41) Wash. 691.
- starch, microphotograph of, (48) 708.
- stem rust resistance, (47) Calif. 647.
- stem rust resistance, breeding for, (50) 246.
- straw—
 - digestibility, (43) 569; (45) 673.
 - for wintering lambs, (50) 574.
 - for work horses, (41) Mo. 675; (43) 775.
 - hydrolyzed, feeding value, (48) 265, 871.
 - sugar content, (43) 671.
 - sugars and albuminoids of, (49) 65.
 - v. clover hay, feeding value, (48) 398.
 - v. hay, feeding value, (46) 765.
- stripe disease, (44) 842.

Oatmeal—

- analyses, (42) 263, Tex. 769.
- by-products, analyses, (41) N.Y.State 868; (42) Mich. 63; (45) N.Y. State 469.
- by-products, digestibility and productive value, (47) Tex. 472.
- phytin content, (47) 366.

Oats—

- acidity determination, (42) 11.
- Algerian, feeding value for poultry, (48) 75.

Oats—Continued.

- amino acid content, (41) 367; (46) 504.
- analyses, (47) N.Y.State 172.
- analyses and use as feeding stuffs, (45) 373.
- analyses of grain and straw, (45) 739.
- and barley as hay crop, comparison, (44) Alaska 327.
- and barley, culture, (49) Alaska 491.
- and barley, culture experiments, (47) Minn. 331.
- and barley, yielding capacity, (48) 830.
- and corn, feeding value, (46) Ill. 678.
- and peas—
 - as orchard cover crops, (43) Pa. 358.
 - as silage and soiling crop, (49) Oreg. 526.
 - as silage crop, (41) Mo. 334; (42) Wash. 828.
 - as spring forage, (41) 637; (43) Mo. 736.
- culture experiments, (49) Mont. 430.
- fertilizer experiments, (42) Minn. 826.
- seeding experiments, (49) Mont. 430.
- yields, (41) N.J. 35; (42) Minn. 826.
- and tares, digestibility and metabolizable energy, (48) 167.
- and wheat, culture experiments, (47) Minn. 331.
- as affected by—
 - alkali salts, (41) 623.
 - ammonia nitrogen, (41) 815.
 - ammonium sulphate, (47) Mass. 218.
 - bat guano, (45) Mo. 121.
 - borax, (44) Me. 129.
 - calcium, (46) Ky. 816.
 - carbon dioxid, (43) N.Y.Cornell 813; (44) 725.
 - chlorin, (41) 724.
 - clover, (44) Alaska 327.
 - fineness of lime, (43) 325.
 - Hessian fly, (41) Kans. 34.
 - pepto-humic fertilizer, (44) 420.
 - potash, (49) 816.
 - potash and kainit, (44) 515.
 - sodium arsenate, (47) 120.
 - sodium arsenite, (41) 625.
 - sodium carbonate, (45) 116.
 - sodium chlorid, (45) 586.
 - stones in soil, (41) 813.
 - sulphur, (44) 129; (46) Wash. 427, 822.
 - superphosphate, (47) Minn. 124.
 - weather, (47) Minn. 116; (49) 115.

Oats—Continued.

- as emergency hay crop, (49) Wis. 629.
- as hay crop, (41) Alaska 30; (42) Mich. 631; (43) 527; (44) Alaska 328, Alaska 329; (47) Calif. 631; (48) N.Dak. 226.
- as nurse crop, (41) Mo. 637; (47) Ohio 137; (48) N.Dak. 29; (49) 736.
- as orchard cover crop, (41) Kans. 41, Del. 145.
- as pasture for pigs, (42) Mont. 68.
- as phytometer, (41) 327.
- as short season hay crop, (47) Mich. 131.
- as silage crop, (50) Alaska 532.
- assimilation of nutrients, relation to soil fertility, (50) 18.
- black stem rust resistance, inheritance of, (50) Minn. 143.
- blasting of panicles, (41) Nev. 227.
- "blindness" in, cause, (45) 361.
- breeding and selection, (47) La. 428.
- breeding experiments, (41) Alaska 31, N.C. 638, N.Y.Cornell 641, Minn. 730; (44) Kans. 224, Alaska 327, Alaska 329, Alaska 521, 526; (46) 633; (48) Mich. 224, 434, S.C. 629; (49) Miss. 428, Tex. 429, Oreg. 525, Idaho 732; (50) Minn. 132.
- breeding for hardiness, (42) Ala.Col. 821.
- breeding for rust resistance, (41) Iowa 227.
- by-products, composition and digestibility, (46) Mass. 476.
- certification in Germany, (50) 439.
- classification, relation to variety tests, (49) 827.
- climatic requirements, (41) U.S.D.A. 417.
- clipping tests, (42) Ohio 830.
- composition as affected by soils and fertilizers, (41) 422.
- cost of production, (41) Minn. 91; (42) Mo. 188; (43) Ohio 392; (44) N.Dak. 88, N.Dak. 190, U.S.D.A. 789, Mo. 790; (45) 191; (46) Mo. 387, 590; (47) Mo. 192; (49) Ind. 592, N.Y.Cornell 691; (50) Ind. 389, Can. 592.
- cost of production in France, (42) 593.
- cost of production in Westphalia, (47) 93.
- cost studies, (50) Can. 432.
- crushed v. whole, for work horses, (42) Wis. 375.
- cultural directions, (46) Wash. 437.
- culture, (41) Minn. 387; (43) Mich. 639; (44) Alaska 328; (45) 630; (47) Wis. 335, Nebr. 735.

Oats—Continued.

- culture—
 - and uses in Scandinavia, (48) 229.
 - experiments, (41) Nebr. 36, 334, Can. 528, Mich. 636, Mo. 637, 639, N.Dak. 824; (42) 132, 233, N.Dak. 732, Minn. 824; (43) U.S.D.A. 134, Ark. 137, Mont. 332, Ohio 334, Nebr. 637, Mont. 739, 824; (44) N.Dak. 31, Alaska 522, 526, 527; (45) N.Dak. 225, Mont. 339, U.S.D.A. 530, N.Dak. 734; (46) U.S.D.A. 724, Mo. 834; (47) Okla. 824; (48) N.Dak. 30, 434, Can. 450; (49) 329, Okla. 414, Tex. 429, Oreg. 525, Can. 734; (50) Can. 231, Alaska 532.
- in British Columbia, (42) 733.
- in lead and zinc regions, (43) 513.
- in Morocco, (49) 595.
- in Saskatchewan, (48) 530.
- in South Africa, (41) 528.
- on moor soils, (44) 422.
- on peat soil, (43) 23; (45) 735.
- on reclaimed peat swamps, (43) Oreg. 22.
- on sandy soils, (41) Wis. 18.
- rotation v. continuous, (49) Okla. 433.
- damage from various causes, (44) U.S.D.A. 118.
- damp, treatment, (45) 437.
- decomposition rate in soil, (46) N.Y. Cornell 212.
- dietetic value, (47) 668.
- digestibility and productive value, (47) Tex. 472.
- digestibility coefficients, (48) 574.
- disking v. plowing corn lands for, (45) Mich. 432.
- dockage removal at the thresher, (47) 91.
- double germination of, (45) 532.
- drilling tests, (42) Ohio 632.
- effect of—
 - different pH values, (50) 232.
 - fallowing, (48) Minn. 322.
 - liming, (45) Ohio 233.
 - nitrogen at different periods of growth, (49) 132.
 - number of plants per hill, (41) N.J. 36.
 - position of grain, (41) N.J. 36.
 - preceding crop, (45) 738; (48) N. Dak. 31; (49) Mont. 129, Nebr. 527.
- effect on following crop, (45) N.Dak. 226; (49) Mont. 129, Ohio 329.
- effect on following turnip crop, (41) 231.

Oats—Continued.

- effect on soil acidity, (47) 723.
- effect on soil nitrate content, (41) Mo. 623.
- energy value, (47) 69.
- exotic, tests in Algeria, (45) 35.
- exudate water from, solids in, (49) N.Y.Cornell 520.
- fall-sown, culture, (43) Wash. 738; (44) U.S.D.A. 37.
- false wild, delayed germination, (50) 531.
- false wild, origin, (48) 33; (50) 531.
- farm and market prices, (48) U.S.D.A. 92.
- feeding to poultry, method, (49) Idaho 777.
- feeding value, (42) Ohio 871; (46) Iowa 363.
- fertilizer experiments, (41) N.Y.Cornell 21, 22, Me. 131, N.Dak. 140, 228, 229, 230, 334, 424, 425, 729, 815; (42) 22, 221, 222, 223, 233, N.Y.State 326, 327, Wis. 327, Ohio 636, 719, Minn. 731, Ala.Col. 822, Minn. 825; (43) Okla. 32, S.C. 126, 322, N.C. 424, Minn. 627, Can. 727; (44) 128, Kans. 225, 317, Minn. 321, 421, Alaska 513, 632, Ala.Col. 722, 815; (45) Ill. 121, Ohio 126, Ohio 233, 518, 532, Can. 817; (46) 131, 227; (47) S.C. 24, Wash. 124, Miss. 217, Minn. 320, 322, Ga. 427, 815; (48) Minn. 322; (49) 329, Ga. 524; (50) Minn. 121, 423.
- following alfalfa, (44) U.S.D.A. 33.
- following different crops, (45) N.Dak. 226.
- following Kafir corn, (41) Kans. 34
- for calves, (41) 873; (45) 379.
- for hay, variety tests, (49) Can. 734.
- for laying hens, (41) 675.
- for winter pasture, (41) U.S.D.A. 470
- for wintering lambs, (50) 574.
- from Volga region, composition, (50) 169.
- frost injured, reseeding on moors, (41) 734.
- frost injury, (41) 335.
- Fulghum, history, (46) U.S.D.A. 134.
- germination—
 - effect of fertilizers, (44) Va. 721.
 - effect of organic substances, (41) 523.
 - effect of soil acidity, (47) 722.
 - of shelled grain in, (42) 136.
 - tests, (42) Wis. 338.
 - when freshly harvested, tests, (42) 237.
- giant aberrants, (50) 32.
- grass, liming experiments, (46) 426.
- green manuring experiments, (41) Del. 136; (42) Va. 427, Miss. 622.
- greensand marl for, (41) N.J. 23.

Oats—Continued.

- ground, analyses, (41) Can. 564; (42) Tex. 769; (43) Vt. 464; (45) Tex. 68, Vt. 872; (46) Can. 167, Tex. 675; (47) Mass. 274, Conn.State 570.
- ground, for calves, (44) 776.
- growing with barley, (41) S.Dak. 435.
- growth, effect of seed treatment, (50) 736.
- growth in alkali soil, early, (42) Utah 28.
- growth in artificial light, (48) 26.
- harvesting, economics of, (48) 186.
- harvesting in Argentina, (47) 32.
- hemipteran pest, (41) 551.
- hybrid, studies, (46) 231.
- hybridization, technique, (45) 737.
- improvement, (45) Mich. 223; (46) 830.
- inheritance and yield, (48) Minn. 335.
- inheritance of awn, (41) N.Y.Cornell 641.
- inheritance studies, (44) Mont. 331.
- irrigation experiments, Utah (41) 141; (43) 230.
- irrigation water requirements, (47) Kans. 630.
- Japan, yields, (49) Pa. 223.
- Kanota, description, (45) Kans. 738.
- lime and magnesia content, (45) 425.
- liming experiments, (42) 523; (45) Miss. 126, Ohio 126, Can. 817; (46) 131.
- limits of toxicity of ammonium sulphate for, (42) 219.
- lodging, factors affecting, (49) Wis. 629.
- lodging in, (41) 636.
- manuring experiments, (42) Minn. 826; (43) Utah 218, Minn. 627, Minn. 815; (45) Ohio 126; (49) Can. 734.
- manuring experiments under irrigation, (41) Utah 141.
- Mendelian characters, (44) 428.
- multiflorous variation in, (50) 227.
- naked, characteristics, (50) 227.
- natural hybrids in, (49) 529.
- nickel in, (49) 520.
- nitrogen application, time of, (44) Calif. 724.
- official standards, U.S.D.A. (41) 532, 636.
- oil extraction, (46) 502.
- origin, means of tracing, (47) 529.
- Orion, description, (47) 530.
- peas, and vetch as silage crop, (41) 676.
- period of greatest nitrate utilization, (43) Ill. 215.
- phosphoric acid content, relation to fertilization, (43) 518.
- phosphorus requirements, (44) R.I. 32.
- phototropic stimuli, path of transmission, (48) 728.

Oats—Continued.

- plat tests, technique, (41) 432.
- plowing tests, N.Dak. (44) 509; (45) 226.
- plowing v. disking for, (41) Nebr. 434.
- prices, geographical phases, (41) U.S. D.A. 593.
- prices, relation to butter prices, (44) 872.
- production—
 - and movement, 1850–1860, (44) 387.
 - in United States, statistical study, (49) U.S.D.A. 389.
 - in Yugoslavia, (48) U.S.D.A. 529.
 - trade, and foreign competition in, (49) 794.
- prolific and other dwarf, (50) 822.
- proportion of kernel to husk, (44) 227.
- protein in, factors affecting, (47) Calif. 625; (48) 529; (49) 821.
- Puccinia graminis on, biologic forms, (49) 840.
- purchasing power, (49) Nebr. 292.
- pure-line selections, (48) Mo. 628.
- rate of manuring tests, (50) Minn. 120.
- response to fertilizers, (48) R.I. 518.
- rolled, analyses, (42) 769; (46) Tex. 675.
- rolled, digestibility, (48) 257.
- rotation experiments, (41) N.Y. Cornell 21, Ohio 136, R.I. 434, N.Dak. 824; (42) 132, 230, U.S.D.A. 336, Minn. 731, 824; (43) Okla. 32, U.S.D.A. 435; (44) Minn. 330, N.Dak. 524, 632, U.S.D.A. 732; (45) Ohio 119, 126, N.Dak. 216, Mont. 339, N.Dak. 734, 735; (46) 131, U.S.D.A. 725, 819; (47) Minn. 121, Miss. 216, Minn. 332, Alaska 527; (48) N.Dak. 224, Minn. 321; (49) Oreg. 526, Ohio 725; (50) N.Y. State 422.
- seed—
 - as affected by heat, (41) 430.
 - drying, (41) 730.
 - fertilizing before planting, (48) 529.
 - frosted and nonfrosted, physical properties, (48) 436.
 - germination, (44) 233.
 - infection, studies, (48) 46.
 - iron and manganese content, (49) 202.
 - longevity of, (43) 832.
 - size as affecting yield, (41) 536.
 - standards, (47) 39.
 - treatment, (41) Mo. 654, 737; (42) 541, 644; (43) 642.
 - treatment, effect, (50) 736.
- seeded on corn, effect of residual manure, (49) Mont. 130.
- seeding and harvest dates, temperature effect, (41) U.S.D.A. 716.

Oats—Continued.

- seeding experiments, (41) N.J. 36, Nebr. 36; (42) Wash. 632, Minn. 732; (43) Ark. 138, Ohio 334, N.C. 434; (44) Wash. 225, 227, N.Dak. 524, Oreg. 826; (45) Mo. 224, N.Dak. 225, Can. 823; (46) 227, Iowa 326, 531; (47) U.S.D.A. 330, Minn. 332, Wis. 432, Ark. 732; (48) N.Dak. 225, Minn. 331; (49) Ohio 733, Can. 734; (50) Minn. 132.
- selection experiments, (41) Minn. 731.
- side, new classification, (49) 133.
- silage, palatability tests, (45) 375.
- sodium for, (41) R.I. 426.
- State standards, (44) Mont. 143.
- statistics, (41) 826; (42) U.S.D.A. 731.
- sterility, (47) U.S.D.A. 45.
- straw, effect on soil reaction, (46) 211.
- subsoiling and packing experiments, (45) N.Dak. 212.
- sulphur fertilizers for, (41) 427.
- tillage experiments, (45) N.Dak. 225.
- tillage methods, (48) N.Dak. 224.
- time of cutting tests, (49) Can. 734.
- time of seeding, effect on smut, (44) 151.
- toxic limit of alkali for, (49) 513.
- utilization of phosphates by, (45) 217.
- v. barley for work horses, (44) Wis. 269.
- v. corn, feeding value, (49) 69.
- v. rice meal as cattle feed, (43) 172.
- varietal nomenclature, (46) 829.
- varieties, (43) U.S.D.A. 637, Ariz. 733; (45) Wyo. 431; (46) Tex. 328, Mich. 633; (47) Minn. 129, Minn. 331, Pa. 429, Alaska 527; (49) Ga. 524, Wis. 629, Iowa 732.
- varieties—
 - analyses, (46) 633.
 - as hay crop, (44) Calif. 731.
 - characteristics, (50) 237.
 - description, (49) U.S.D.A. 825.
 - for Canada, (47) 823.
 - for seed in Poland, (50) 439.
 - fungus diseases on, (50) 548.
 - in Australia, classification and description, (49) 736.
 - in British Isles, (47) 826.
 - in New South Wales, (42) 438; (45) 535.
 - in Saskatchewan, (48) 530.
 - in Utah, (41) 434.
 - new, description, (46) 531.
 - percentage of husk in, (42) 136.
 - yielding capacity, (49) 827.
 - yields, (44) Alaska 327; (45) Wis. 132, 630; (46) Kans. 435.
- variety and strain tests, plat technique, (47) Mo. 329.
- variety, new, in Sweden, (46) 636.

Oats—Continued.

- variety, new, yields, (46) Iowa 326.
- variety survey key, (44) Utah 137.
- variety tests, (41) Alaska 30, Alaska 31, Del. 137, Idaho 225, Idaho 226, Iowa 227, Nev. 227, 229, Ariz. 331, 334, Mich. 636, 638, Mo. 638, N.C. 638, 729, N.Dak. 824, Wash. 826; (42) 132, 233, U.S.D.A. 337, Mich. 631, Wash. 631, Minn. 731, N.Dak. 732, Minn. 824, Minn. 826; (43) Okla. 32, 34, N.H. 34, Md. 134, U.S.D.A. 134, Wyo. 135, Ark. 137, Nev. 228, 231, 232, N.Dak. 332, Ohio 334, 528, Minn. 636, U.S.D.A. 639, Can. 735, Mo. 736, Wash. 737, Minn. 823; (44) N.Dak. 30, Kans. 224, Wis. 226, 227, Alaska 327, Alaska 329, Minn. 330, Mont. 331, Iowa 431, Alaska 521, Alaska 522, Alaska 523, Ariz. 524, N.Dak. 524, S.C. 525, Utah 525, 526, 632, Minn. 732, Va. 732, Oreg. 826, Oreg. 827; (45) Ohio 126, Miss. 223, Mo. 224, N.Dak. 225, Wis. 227, 233, Okla. 430, U.S.D.A. 530, 532, 735, 736, 738, Can. 822; (46) 131, 227, Mo. 326, Mont. 327, N.H. 328, Wash. 437, 531, 633, S.C. 725; (47) Mich. 129, Minn. 130, Nev. 131, Wyo. 131, U.S.D.A. 330, Minn. 332, Minn. 333, Wis. 335, Alaska 526, Alaska 527, Ark. 733, Okla. 823, 824; (48) N.Dak. 30, 31, N.Dak. 31, Ga.Coastal Plain 128, N.Dak. 225, Can. 227, Minn. 331, Minn. 332, N.Dak. 438, Ga.Coastal Plain 628, Mo. 628, 730; (49) 31, Mont. 129, Pa. 223, Wash.Col. 224, 232, 329, Alaska 426, Kans. 427, Miss. 428, Okla. 428, Tex. 429, Wyo. 429, Ky. 525, N.Mex. 525, Oreg. 525, Idaho, 732, Ohio 733, Can. 734, 825, U.S.D.A. 825; (50) Minn. 133, Mont. 133, West.Wash. 134, Can. 432, Pa. 432, Can. 533.
- water requirements, (50) 828.
- wheat nematode attacking, (43) 751.
- wheat-head army worm affecting, (43) 54.
- whole, v. chop, feeding value, (50) 272.
- wild, analyses, (44) N.Dak. 386.
- winter, as pasture feed, (43) U.S.D.A. 171.
- winter, variety tests, (43) Md. 134.
- winterkilling, remedies, (43) Ark. 138.
- winterkilling, resistant variety, (42) Ala.Col. 821.
- world's production and consumption, (42) 439.
- yield cycles, (41) 892.
- yield, effect of seed weight, (47) 335.
- yields, (43) 829; (44) N.Dak. 30, Wash. 225, U.S.D.A. 228, Mont. 331; (46) Mont. 327; (47) Wash.Col. 528; (48) N.Dak. 30; (49) Mont. 130; (50) Can. 432.

Oats—Continued.

- yields—
 - as affected by sulphur composts, (45) 26.
 - from experiment fields, (45) Ill. 727.
 - from small seeds, (47) Minn. 331.
 - in Australia, (43) 528; (46) 132.
 - in New Jersey, (46) 225.
 - under livestock and grain systems, (49) S.Dak. 528.
 - with different systems of farming, (44) S.Dak. 626.
- Oberly, E. R., memorial prize, (50) 900.
- Ochromoigenia ormioides, description, (49) 453.
- Ocimum sanctum, use as insecticide, (42) 736.
- Oenogryia amanda, life history notes, (46) 559; (48) 554.
- Odina wodier, description, (47) 43.
- Odonata of New England, manual, (44) 57.
- Odontia spp., studies, (42) 745.
- Odontotermes formosanus, notes, (42) 851.
- Odontria zealandica, control, (45) 459.
- Oebalus pugnax on rice, (43) U.S.D.A. 253.
- Oecacus (Acanthia) hirundinis, attacking nestling birds, (44) 553.
- Oecanthus—see also Crickets, Tree.
 - nigricornis, notes, (46) 50.
 - niveus, notes, (50) V.I. 555.
 - pellucens, egg parasites of, (47) 660.
- Oeceticus kirbeje, control, (45) 854.
- Oeceticus kirbyi platensis, new parasites of, (47) 657.
- Oedemagena tarandi, notes, (47) 257.
- Oenophthira pilleriana—
 - parasites of, (50) 561.
 - remedies, (41) 59.
 - studies, (50) 659.
- Oenothera—
 - chromosome number, (41) 224; (47) 126.
 - crosses, (47) 822.
 - hybrids, Mendelian splitting in pollen, visibility of, (43) 521.
 - inheritance studies, (41) 431, 634, 821; (43) 729, 818; (44) 26.
 - lamarckiana simplex, notes, (43) 521.
 - mutation in, (42) 332.
 - mutations, size characters, (41) 224.
 - pollen tube growth and disturbances in Mendelian numbers, (47) 822.
 - relation between stature and chromosome number, (42) 332.
 - spp., studies, (42) 128.
- Oenotheras as nuclear chimeras, (43) 223.
- Oesophagostomiasis, lecture on, (42) 674.
- Oesophagostomum columbianum—
 - effect on coagulation of blood, (45) 477.
 - in sheep, (46) 685.
 - injury to lambs and sheep, (45) 182.
 - notes, (43) 883.
- Oesophagostomum venulosum, notes, (47) 883.
- Oesophagus of the horse, paralysis, (44) 76.

Oestridae of Brazil, (41) 852.

Oestrous cycle—

- in carabao, (42) 669.
- in guinea pigs, (42) 668.
- in guinea pigs, effect of underfeeding, (44) 173.
- in mammals, comparison, (50) 635.
- in mice, (50) 635, 826.
- in rats, (42) 667.
- in rats, changes in uterus during, (44) 173.
- in the opossum, (50) 636.
- relation to morphological and physiological changes, (50) 635.

Oestrus—

- and fecundity in guinea pigs, (48) 471.
- and ovulation in mammals, (50) 531.
- effect of administration of hypophyseal substance, (47) 69.
- effect on milk production, (46) Ky. 372.
- ovis, *see* Sheep botfly

Offal content of flour, (43) 314.

Office of—

- Experiment Stations, monograph, (50) 606.
- Farm Management, U.S.D.A. (41) 292, 386.
- Farm Management, relation to experiment stations, (42) 789.
- Farm Management, research work in rural economics, (42) 789.

Ohio—

- State University, notes, (41) 499, 798; (42) 797; (43) 399, 900; (44) 397, 700; (45) 200, 499; (46) 97, 396; (47) 699; (48) 698; (49) 198, 497, 698, 900; (50) 900.
- Station, administration and work, (42) 899.
- Station, county experiment farms, reports, (45) 198.
- Station, monthly bulletin, (41) 198, 299, 598; (42) 397, 496, 694, 899; (43) 397, 798; (44) 195, 394, 796; (45) 299, 497; (46) 394, 793; (47) 196, 697, 898; (48) 193; (49) 298, 395, 696, 798; (50) 195, 598.
- Station, notes, (41) 199; (43) 399, 700, 900; (44) 299, 397, 899; (46) 396; (47) 899; (49) 198, 497; (50) 699.
- Station, report, (43) 397; (45) 198; (47) 497; (49) 395.

Oidia in cream and butter, (48) 80.

Oidiomycosis, bovine, (49) 377.

Oidiopsis sp., notes, (49) 839.

Oidium—

- control, (42) 49, 450.
- in forests of France, (45) 753.
- infection and developmental experiments, (50) 143.
- lactis—
 - cause of butter deterioration, (42) 674.
 - development, (45) 463.

Oidium—Continued.

lactis—continued.

- effect on spoilage of butter, (47) 784; (50) 476.
- gold absorption by, (41) 329.
- in banana must, (41) 716.
- in creamery butter, (44) 874.
- notes, (49) 845.
- resistance to sunlight, (47) 784.
- rôle in cheese making, (42) 877.
- sensitiveness to vitamins, (41) 558.
- studies, (42) 674.
- leucoconium on peach, (43) 349.
- preventive treatment, (44) 848.
- quercinum, ascophore form, (44) 347.
- quercinum, notes, (48) 352.
- rubrum, description, (48) 773.
- sp., new leaf disease of Hevea, (43) 49.
- sp., notes, (47) Fla. 650.
- tuckeri, ascospores of, (45) 751.
- tuckeri, notes, (42) 49, 741; (45) 653, 850.

Oil—

- analysis, official method, (44) 9.
- anthracene, remedy against termites, (42) 851.
- burners, palm oil as fuel, (47) 90.
- cake flour, characteristics and detection, (41) 467.
- cake meal, ground, analyses, (48) 68.
- cake meal v. tankage for pigs, (50) Can. 776.
- cakes—
 - acid numbers, (42) 112.
 - ammonification and nitrification experiments, (49) 118.
 - analyses, (41) 428.
 - bacterial transformation, (41) 816.
 - decomposition, nitrates from, (46) 714.
 - feeding value, (43) 573; (50) Can. 470.
 - fertilizing value, (42) 22, 723.
 - in animal feeding, (44) 363.
 - nitrification, (41) 517.
- camphor green, remedy against termites, (42) 851.
- cassia, determination of lead in, (43) 14.
- coconut, rancidity of, (43) 201.
- colune, digestibility, (42) 552.
- corn—
 - composition, (47) 10.
 - extracting methods, (47) U.S.D.A. 11.
 - hydrogenation, (47) 502.
 - preparation and uses, (48) 310.
 - refining, (47) U.S.D.A. 10.
- crops, culture in Finland, (44) 436.
- crude, emulsion, value, (44) Calif. 752.
- emulsions, constitution, (50) 554.
- emulsions, new method of making, (50) Mo. 51.
- emulsions, preparation, simplified method, (50) 657.

Oil—Continued.

- engine, reclamation, (44) Calif. 786.
- eucalyptus, bibliography, (47) 443.
- extraction from avocado, (48) Calif. 506.
- from American conifers, analytical constants of, (42) 7.
- from cantaloupe seeds, analysis, (44) 503.
- from *Ceratotheca sesamoides*, (42) 115.
- from chia seed, (45) 613.
- from Chinese wood oil trees, (42) 840.
- from cockle-bur, analyses, (43) 801.
- from Egyptian lettuce, analysis, (42) 202.
- from elderberries, analysis, (42) 410.
- from eucalyptus, germicidal activity, (42) 174.
- from fenugreek seeds, (41) 803.
- from fruits and seeds, summary, (42) 212.
- from grape seeds, (42) 212; (45) U.S.D.A. 209; (46) 613.
- from hazel-nuts, nature of, (47) 12.
- from horse-chestnut, analysis, (42) 115.
- from lumbang nuts, production, (42) 116.
- from "Mac-Ken" nuts, analysis, (42) 115.
- from *Momordica* seeds, analysis, (43) 316.
- from okra seed, analysis, (42) 311.
- from *Papaea* seeds, analyses, (43) 801.
- from pine seeds, (42) 410.
- from poppy seed, digestibility, (42) 552.
- from proso, analysis, (42) 801.
- from pumpkin seeds, (41) 209.
- from sharks' livers, (42) 659.
- from soy beans, composition, (43) 610.
- from squash seed, analysis, (42) 311.
- from sumac, (41) 710.
- from sunflower seeds, (41) 209.
- from sunflowers, drying tendencies, tests, (42) 591.
- from tobacco seeds, analyses, (44) 201.
- from tomato seeds, (41) 502; (42) 212.
- from tropical seeds, analyses, (47) 803.
- from Virginia creeper seeds, (41) 710.
- from walnuts, analysis, (42) 410.
- fuel, handbook of information, (42) 892.
- fungus, digestibility and use, (46) 68.
- in corn, (45) 416.
- in cottonseed, relation to gossypol, (50) 111.
- in soy beans, (49) Ohio 308.
- lemon, index of adulteration, (41) 715.
- manufacture from grape seeds, (46) 509.
- meal, feeding value, (50) Ohio 170.

Oil—Continued.

- miscible, insecticidal value, (44) Mo. 856.
- neat's foot, composition, (48) 310.
- of chenopodium, composition, (43) 502.
- of prickly pear seed, analyses, (44) 802.
- of *Rubieva multifida*, analysis, (43) 502.
- palm—
 - disease, notes, (43) 849; (47) 651; (48) 45; (49) 540.
 - diseases in West Africa, (46) 348.
 - industry, (42) 44.
 - industry in West Africa, (45) 540.
 - injury from hispid beetle, (44) 854.
 - nut, energy value, (47) 69.
 - seeds, attacked by pit borer, (44) 855.
- palms—
 - and fruit, (49) 141.
 - and products of West Africa, (49) 342.
 - breeding experiments, (49) 735.
 - culture, pruning, and pollination, (45) 441.
 - Fomes lucidus* on, (43) 652.
 - insects affecting, (42) 451; (45) 455.
 - of Dutch East Indies, (50) 647.
 - varieties, yield, (44) 147.
- plants, culture experiments, (41) 230.
- plants, culture guide, (44) 137.
- plants, production and use, (47) 239.
- seed plants—
 - breeding experiments, (44) 632.
 - culture experiments, (44) 632; (45) 532; (48) 434.
 - fertilizer experiments, (44) 632.
 - insects affecting in India, (45) 656.
 - variety tests, (44) 632.
- seeds—
 - analysis, (44) 413.
 - culture in India, (41) 529.
 - from Philippines, survey, (44) 640.
 - in Tropics, (42) 599.
 - Indian, trade in, (44) 828.
 - insects affecting, (50) 153.
 - nitrogen and oil content, (47) 128.
 - production, in Germany, (44) 138.
 - South American, studies, (46) 108.
 - tests of samples, (45) 340.
 - tropical, analyses, (47) 803.
- sprays, miscible, value, (47) 759.
- Oiled wrappers for apple scald control, (50) U.S.D.A. 552, 841.
- Oils—see also Fats, Corn oil, Cottonseed oil, etc.
 - acetyl values, determination, (50) 11.
 - analysis, (44) 412.
 - analysis, microanalytical methods, (45) 806.
 - analysis, treatise, (49) 608.
- and fats—
 - analyses, (43) Conn.State 859.
 - annatto in, test, (45) 508.

Oils—Continued.

- and fats—continued.
 - chemistry of, (42) 8.
 - edible, (41) 558.
 - handbook, (45) 410.
 - in United States, (42) U.S.D.A. 7.
 - inspection, (47) Conn.State 559.
 - production from oil seed plants, (43) 638.
 - technology, colloid chemistry in, (50) 801.
 - treatise, (45) 501, 801.
 - unsaponified matter, (50) 196.
- animal and vegetable statistics, (47) 711.
- animal, treatise, (45) 203.
- as lubricants, critical temperature, (46) 781.
- by-product, digestibility, (41) U.S.D.A. 170.
- catalytic hydrogenation, (50) 610.
- changes in storage, (41) 310.
- chemistry of, progress, (41) 613.
- chemotherapeutic studies, (46) 579.
- coconut and palm, evaluation, (41) 115.
- color measurement, (47) 716.
- commercial, book on, (41) 10.
- crude, for orchard heating, (49) Oreg. 533.
- decolorization with kelpchar, (47) 411.
- drying films, stress-strain measurements, (46) 586.
- edible—
 - losses in refining, (49) 311.
 - substitutes for, (47) 612.
 - treatise, (47) 311.
 - vitamin A content, (49) 59.
- effect on streptococci growth, (48) 658.
- essential—
 - bibliographic review, (45) 720.
 - chemistry, (46) 308; (48) 107.
 - from apples, (43) 711.
 - from Philippines, (44) 640.
 - iodin number defined, (43) 315.
 - microchemical research, (44) 713.
 - notes, (48) 842.
 - preserving value, (42) 114.
 - stimuli from, (44) 458.
 - substitutes in Germany, (43) 204.
 - table of refractive indices, (42) 712.
 - treatise, (42) 8.
- ethereal, plants producing, (50) 140.
- ethereal, review of literature, (45) 9.
- eucalyptus, analyses, (45) 350, 613.
- extraction from leather, (46) 114.
- fish, substitute for sulfonated castor oil, (44) 205.
- fixed, change of refractive indices, (42) 409.
- floor, tests, (48) 387.
- for lubrication of tractor engines, section, (43) 89.
- for paint, tests, (47) 390.
- from various residues, (47) 613.
- from various seeds, (41) 501.

Oils—Continued.

- fuel, for pump irrigation, (45) Ariz. 80.
- hardened, analyses, (42) 416.
- hydrocarbon, treatise, (48) 206.
- hydrogenated, coefficients and digestibility, (49) 560.
- hydrogenated, digestibility, (45) 62.
- hydrogenated, for oil baths, (50) 201.
- hydrogenated, in nutrition, (42) 255.
- hydrogenated, industrial uses, (49) 507.
- hydrogenated, physiological value, (46) 565.
- hydrogenation, (41) 310, 805; (42) 409; (43) 416; (45) 317; (47) 608.
- in Tropics, (42) 599.
- industry in France, (43) 261.
- iron in, (43) 202.
- lubricating—
 - carbonization, (44) 887.
 - effect of dilution, (43) 86.
 - effect on fuel consumption, (42) 389.
 - for control of San José scale, (47) U.S.D.A. 453; (49) Mo. 253, U.S.D.A. 354, 355.
 - friction testing, (49) 387.
 - lasting qualities with kerosene fuel, (47) Wis. 488.
 - reclamation, (48) 785.
- measurement of viscosity for wood treatment, (43) 283.
- mineral, lubricating properties, (47) 292.
- miscible, as ovicide, (47) Conn. State 155.
- miscible, for fruit tree leaf roller, tests, (49) Mont. 852.
- miscible, spraying experiments, (46) 855.
- moisture content, determination, (44) 713.
- nitrogen constituents, determination, (41) 711.
- nondrying, sources, (46) 109.
- nutritive value, relation to color, (44) 765.
- oriental, characteristics, (41) 10.
- oxidized, engine experiments, (49) 387.
- Philippine, hydrogenation, effect of composition, (50) 309.
- rancidity, cause and nature, (43) 201.
- rancidity detection, (44) 13.
- refined, determining purity, (44) 412.
- refined, sampling and examination, (43) 805.
- refractive indices, (45) 802, 806.
- Renard test, (41) 502.
- saponification number determinations, (43) 505.
- seed, paper on, (48) 842.
- shortening value, (46) 258.
- solubility, measurement, (41) 314.
- sources and uses, (48) 239.
- sterilization, method, (42) 707.
- substitutes in Germany, (43) 204.
- sulfonated, analysis, (44) 205.

Oils—Continued.

sulfonated, determination of sulphate in, (44) 10.

treatise, (47) 292.

vegetable—

acid numbers, (42) 112; (47) 202.
arsenic and nickel content, (42) 610.

as motor fuel, (45) 690; (48) 886; (49) 590; (50) 588.

detection of olive oil in, (50) 313.
extraction, (42) 115.

handbook, (43) 240; (46) 202.

in lard, detection, (48) 206.

increasing unsaturation, (41) 209.

mixtures, analysis, (49) 611.

production and movement, (46) 636.

sources, (47) 239.

standards for, (44) 413.

treatises, (41) 110.

use as affecting hog prices, (44) U.S.D.A. 389.

vitamin A in, (45) 62; (48) 759.

volatile, treatise, (41) 501.

Oklahoma—

College, notes, (41) 499; (42) 94, 797; (43) 200, 498; (44) 97, 700; (45) 499; (47) 699, 899; (48) 397; (49) 600; (50) 699.

Station, notes, (42) 94, 797; (43) 200, 400, 498; (44) 97; (45) 499; (47) 699, 899; (50) 699.

Station, publications available, (43) 496.

Station, report, (43) 98; (45) 496; (47) 898; (49) 495.

Okra—

as trap crop for cotton bollworm, (43) 51.

canned, bacterial flora, (46) 859.

diseases, notes, (41) 745.

pink bollworm on, (45) 759.

seed oil, analysis, (42) 311.

vitamin in, (46) 667.

Oleates, hemolyzing power, (42) 310.

Olene vagans, notes, (41) 354.

Oleo oil and stearin, digestibility, (41) U.S.D.A. 65.

Oleomargarin—*see also* Margarin.

household foam test, (42) 162.

industry and vitamin doctrine, (46) 256.

manufacture and vitamins, (47) 662.

manufacturing uses, (50) 365.

production, (43) U.S.D.A. 179.

salt determination in, (48) 712.

Oleoresin—*see also* Resins.

from Douglas fir, (41) 541.

from thitsi, (41) 345.

from western larch, analyses, (45) 416.

production, (47) U.S.D.A. 644.

Olethreutes—

abietana, notes, (48) Mich. 251.

approximana n.sp., description, (42) 157.

Olethreutes—Continued.

hebesana, notes, (41) Conn.State 159; (44) 352.

Olethreutid, new, from New York, notes, (42) 157.

Olethreutidae—

new, from eastern United States, (49) 760.

revision, (49) 254.

Oligodynamic phenomena, (47) 821.

Oligomerus arbuti n.sp., notes, (41) 63.

Oligonychus—

americanus, notes, (50) Conn.State 50.

ununguis, notes, (48) 556.

viridis, notes, (45) 453.

Oligotmema, new genus, erection, (45) 460.

Oligotrophus alopecuri in Denmark, (41) 460.

Olive fly—

and parasites, (46) 852.

bibliography, (48) 157.

Olive—

industry, (50) 645.

industry in Argentina, (41) 446.

knot organism, (47) Calif. 650.

knot organism, inoculation experiments, (48) Calif. 543.

knot organism, pathogenicity, (50) 752.

Olive oil—

analysis, (45) 806.

and reaction of Villavecchia, (46) 710.

detection in vegetable oils, (50) 313.

detection of tea oil in, (44) 613.

disagreeable flavors, removal, (42) Calif. 805.

distillation with mannitol, (42) 757.

home manufacture, directions, (45) 113.

lipolytic enzymes in, (42) 502.

manufacture, (41) 837.

production, (46) 636.

Spanish, analyses, (41) 802.

sterilization for preparation of lipo-vaccines, (42) 707.

Olive—

pomace, oil from, use, (42) 805.

residue, feeding value, (42) 769.

scab, cause, (46) 244.

scale parasites, (47) 363; (48) 53.

trees, longevity, (50) 743.

twig borer, notes, (44) 256.

wood ashes, analyses, (43) 324.

Olives—

abnormality of blossoms, (49) 40.

action of lye in processing, (42) 113.

breeding experiments, (49) 735.

canned, examination, (42) 261.

canned ripe, botulism from, (43) 865.

canning and pickling, (47) Calif. 614.

color control, studies, (42) Calif. 805.

culture experiments, (48) Ariz. 442.

culture in Spain, (43) 439.

culture in Tunis, (48) 40.

culture, manuals, (41) 837.

cycloconium of, treatment, (42) 645.

decomposition during pickling, (50) Calif. 414.

dodder affecting, (43) 652.

Olives—Continued.

- energy content, (42) 660.
- for Yuma Mesa, (42) Ariz. 341.
- fruit bud differentiation, (48) Calif. 534.
- inflorescence of, (42) 140.
- leaves and fruits, *Bacillus botulinus* on, (49) 861.
- manuring experiments, (44) 536.
- oil in, (45) 742.
- oil in as index of maturity, (42) U.S. D.A. 502.
- pickling, (48) Calif. 507.
- pollination experiments, (43) 239.
- production, (47) Ariz. 40.
- production in French colonial possessions, (42) 32.
- production in United States, (47) U.S. D.A. 143.
- pruning, (42) Calif. 833; (46) 140; (47) Calif. 640, 642; (48) Calif. 445, Calif. 535.

ripe—

- bacteriological studies, (44) 558, 663.
- canned, relation to botulism, (42) 261, 262, 558, 761.
- nutritional value, (44) 762.
- paper on, (41) 799.
- pickling, (46) 208.
- poisoning, summary, (43) 168.
- processing, (43) 316.
- processing and packing, (44) 762.
- processing, in California, (42) 212.
- sterilization, (42) 457.

ripening and pickling, studies, (42) U.S.D.A. 501.

Russian, culture experiments, (48) N. Dak. 239.

- self-sterility studies, (45) Ariz. 438.
- sterilizing and pickling, (44) 762, Calif. 762; (46) Calif. 163.

Olneya beans, utilization, (41) 834.

Olpidium brassicae, notes, (42) 46.

Olympia Agricultural Company—

- research department, (42) 798.

Research Station, closing, (48) 300.

Onchocerca bovis, notes, (50) 359.

Onchocerca gibsoni, transmission, (50) 260.

Onchocerciasis, bovine, possible transmitters, (50) 358.

Onchocerciasis of Queensland cattle, (48) 485.

Oncocerca cervicalis, notes, (49) 284.

Oncopeltus quadriguttatus, notes, (49) 758.

Oncopera mitocera in Queensland, (46) 559.

Oncoscelis sulciventris, control, (50) 454.

Onion—

- blight, notes, (50) 243.
- bulb rot, (47) 351.
- capsid, life history, (48) 853.
- disease in Porto Rico, (50) 748.
- diseases, (41) 154; (42) U.S.D.A. 246; (44) Conn.State 150; (45) Ind. 143, Wis. 244, 649; (46) La. 145.

Onion—Continued.

- downy mildew, notes, (43) 243; (44) 49.
- extract, glucokinase in, (50) 765.
- flavor in milk, removing, (47) N.C. 580.
- fly, life history, (48) 459.
- fly, lunate, notes, (41) 358, 549; (42) 548.
- grass, description and analyses, (46) 639.
- growers' association in Montserrat, (41) 891.
- juice, bactericidal power, (42) 7.
- leaf spot, notes, (50) 243.

maggot—

- bionomics and control, (47) Pa. 459.
- control, (46) Mass. 50; (48) 157, 252.
- imported, control, (46) 352; (48) 52, 852.
- imported, life history, (46) 352; (48) 459, 852.
- papers on, (44) 653.
- poison bait for, (44) N.J. 350.
- rearing on agar jelly, (45) 858.
- summary, (49) Oreg. 255.
- traps for, (42) Mass. 356.

market, (43) U.S.D.A. 595.

mildew fungus, perennial mycelium in, (46) 847.

mildew, notes, (44) 842.

pink root, control, Tex. (45) 247; (46) 343.

red root, notes, (43) 243; (44) 49.

Rhizoctonia disease, studies, (43) Wash. 750; (48) 143.

rot, control, (48) 827.

rust, aecial stage, (48) 244.

seed, production, (43) Ind. 339; (45) Ind. 134; (46) La. 145.

sets, storage rot, Ill. (41) 147, 246.

smudge, (44) 844.

smudge, resistance to, (49) Wis. 644, 843.

smut—

- control, (42) Wis. 350; (43) 153, 654; (45) 543; (49) Oreg. 538; (50) 349.

development and pathogenesis, (47) Mass. 351.

eradication, (45) 649.

in Great Britain, (42) 47; (46) 548.

notes, (44) 344, Mass. 445, Oreg. 841; (48) 242.

relation to climate and culture, (46) 345.

relation to soil temperature, (47) Wis. 446.

treatment, relation to rain, (50) 748.

thrips—

- control, (44) Iowa 452; (48) U.S.D.A. 457; (49) Wis. 653.
- dusting for, (43) 451.

Onion—Continued.

thrips—continued.

- infestation, (47) 54, Iowa, 453.
- nicotin sulphate dust for, (44) U.S.D.A. 652.
- notes, (45) 853.
- white rot, studies, (45) 649.

Onions—

- analyses, (43) 63.
- as affected by carbon dioxide, (44) 725.
- as affected by dolomagnesium, (44) 423.
- as affected by preceding crop, (41) R.I. 135.
- attacked by dodder, (47) 351.
- Bermuda, culture experiments, (50) V.I. 540.
- Bermuda, grades, (43) U.S.D.A. 335.
- cell division, mitotic stages, (44) 630.
- cost of production, (48) 387.
- culture, (48) Minn. 338.
- culture experiments, (44) Mont. 337.
- dehydrated, bacteria and molds in, (48) 60.
- dormancy studies, (46) 538; (50) 300.
- effect on following crop, R.I. (41) 135; (44) 31.
- fertilizer experiments, (41) Mass. 21, R.I. 135, 627.
- fertilizer experiments in India, (42) 517.
- growth in alkali soil, early, (42) Utah 28.
- improved strain, (50) U.S.D.A. 137.
- insects affecting, (43) 450.
- irrigation experiments, (46) Mich. 537.
- malnutrition of, (43) Ind. 345.
- Mendelian characters, (44) 428.
- nickel and cobalt in, (49) 520.
- northern-grown, grades for, (43) U.S.D.A. 236.
- on partially sterilized soils, (41) 515.
- overhead irrigation studies, (50) Minn. 139.
- project study outlines, (44) 596.
- raw, effect on digestion, (45) 764.
- rotation experiments, (41) R.I. 434.
- sodium for, (41) R.I. 426.
- sun-dried, vitamins B and C in, (43) 63.
- time of flower primordia formation in, (49) 137.
- toxic limit of alkali for, (49) 513.
- variety tests, (42) Minn. 835; (44) R.I. 32; (48) N.Dak. 37.
- vitamin B in, (44) 261.
- vitamin B in, effect of cooking, (44) 562.
- vitamins in, (41) 762.
- wireworm attack, control, (41) 462.
- yields following different crops, (44) R.I. 31.

Ontario—

- Agricultural and Experimental Union, (49) 825.
- Agricultural College, history, (45) 495; (46) 392.

Ontario—Continued.

- Agricultural College, notes, (41) 200; (42) 399; (43) 400; (50) 900.
- Corn Growers' Association, (44) 635.
- Experimental Farm, Western, notes, (46) 398.
- Oospora—
 - caseovorans on cheese, (47) 678.
 - lactis, *see* *Oidium lactis*.
 - nicotianae, notes, (44) Wis. 241.
 - pustulans n.sp., description, (42) 149.
 - pustulans, notes, (45) Wash. 243; (46) 847; (48) 245, 348; (49) 44, 47.
 - scabies, *see* Potato scab.
 - variabilis, description, (42) 162.
- Ootetrastichus—
 - beatus, parasitism, studies, (42) 249.
 - sp., notes, (45) 551.
- Oozonium omnivorum, studies, (43) U.S.D.A. 153.
- Opatrum sp., notes, (45) 551.
- Opheltes glaucopterus, parasitism by, (44) 258.
- Ophideris fullonica affecting citrus, (42) 736.
- Ophiobolus—
 - cariceti, notes, (49) Kans. 443; (50) 549, 746.
 - cariceti, pathogenicity, (50) 145.
 - graminis, notes, (41) 655, U.S.D.A. 746; (43) 152, 243, 347, 750; (44) 49, 343; (45) 445; (46) 240; (47) 840; (49) 541.
 - spp., notes, (46) 44.
- Ophiodothella fici n.sp., notes, (41) 750.
- Ophion bifoveolatum, parasite of white grubs, (42) 549.
- Ophiurus cerymbosus, analyses, (45) 376.
- Ophiura melicerte, notes, (42) 751.
- Ophthalmia—
 - and diet, review of literature, (45) 569.
 - and growth, relation to light, (50) 364.
 - and vitamin A deficient diet, (46) 469; (50) 60.
 - effect of dried spinach in diet, (50) 263.
 - histological study of paraocular glands, (50) 464.
 - myiasis externa due to Oestrus ovis, (50) 259.
 - not due to lack of vitamin A, (48) 464.
 - of cattle, studies, (50) 184.
 - pathological anatomy produced by unfavorable diets, (49) 461.
 - pathology, (45) 570.
 - recurrent, bacterial flora in, (43) 472.
 - recurrent, observations, (42) 678.
 - specific, studies, (43) 472.
- Ophthalmology, textbook, (47) 878; (50) 379.
- Ophthalmothrips, new genus, erection, (42) 154.

Ophyra—

- leucostoma, flight distances, (41) 259.
- nigra, overwintering, (48) 157.

Opium poppy, flower color in relation to morphine content, (46) 125.

Opium soils of India, phosphate requirement, (41) 816.

Opius—

- fletcheri, parasitism by, (43) 455; (44) 660.
- humilis, studies, (42) 654.
- n.spp., description, (42) 655.
- testaceus, notes, (47) 658.

Oplismenus, revision, (44) 327.

Opossums, breeding, (48) 768.

Opuntia—see also Cactus.

- blakeana, normal and etiolated shoots, studies, (45) 337.
- fulgida, perennation and proliferation of fruit, (43) 328.
- growth, new high-temperature record for, (48) 824.
- inermis, fungus disease, (41) 248.
- inermis, utilization and eradication, (41) 735.
- root growth, oxygen response, (41) 132.
- spp., analyses, (45) 69.
- spp., studies, (43) 222.

Orange—

- basket worm, unusual outbreak, (49) 759.
- black blight, notes, (47) 839.
- brown rot, notes, (44) 49; (45) 842; (49) 150.
- bud abortion, relation to June drop, (43) 247.
- butter, recipe, (48) U.S.D.A. 13.
- collar rot, control, (47) 242.
- disease, new, (48) 746.
- diseases, (43) 243; (45) 653; (47) 44.
- diseases in Cuba, (43) 448.
- diseases, remedies, (46) 553.
- exanthema, notes, (44) 48.
- fly, Japanese, studies, (42) 652.
- grove, navel, renewal, (44) 147.
- groves, effect of altitude on temperature, (42) 537.
- groves of Spain, diseases and pests, (49) 438.

juice—

- analyses, (43) 203.
- and milk, antiscorbutic action, (47) 61.
- antineuritic and growth-promoting value, (43) 460; (45) 863.
- antiscorbutic value, (43) 667; (47) 568.
- bactericidal power, (42) 7.
- concentrated, antiscorbutic property, (41) 470.
- constipating qualities, (42) 57.
- dried, antiscorbutic value, (41) 560; (46) 261, 359.
- dried, antiscorbutic value, stability of, (43) 460.
- dried, vitamin A in, (47) 465.

Orange—Continued.

juice—continued.

- effect on metabolism in paramecium, (42) 662.
- effect on urinary acidity, (48) 163.
- in diet of underweight children, effect, (49) 662.
- minimum antiscorbutic dose, (45) 869.
- v. lemon juice, antiscorbutic value, (42) 463.
- vitamin A in, (49) 769.
- vitamin B determination, (44) 261.
- vitamin C as affected by heat, (43) 567.
- vitamins A and B in, (43) 765.
- June drop, notes, (41) 658; (42) Calif. 842; (43) 247.
- leaves, analyses, (44) 544.
- leaves, injection pressure, relation to canker resistance, (48) 745.
- melanose, notes, (44) 49.
- navel, and pomelo crosses, (46) 735.
- peel, candied, recipe, (48) U.S.D.A. 13.
- peel, jellied, (46) 258.
- peel, vitamin A in, (46) 567.
- pest, new, from Honduras, (50) 155.
- pest, new, in Arizona, (49) 155.
- psoriasis, notes, (41) 658.
- purple scale, in Uruguay, (44) 252.
- root rot, studies, (43) 48.
- rots, popular account, (45) 850.
- rust, notes, (49) Oreg. 546.
- rusts of Rubus, effect on development of stomata, (50) 354.
- rusts, systemic infections of Rubus with, (50) 149.
- scab, notes, (44) 49.
- scaly bark, notes, (41) 658; (49) 847.
- scrub, control, (46) 448.
- sooty mold, notes, (44) 49.
- stocks, studies, (41) 447; (43) 838.
- tortrix, spraying experiments, (47) Calif. 654.
- tree bug, control, (50) 454.
- tree roots, Armillaria mellea on, (47) 754.
- trees—
 - absorption of mineral nutrients, (48) Calif. 533.
 - effect of cover crops, (48) Calif. 533.
 - effect of sodium and calcium chlorid, (49) Calif. 628.
 - effect of sodium, potassium, and calcium, (50) Calif. 327.
 - growth and composition in sand and soil cultures, (49) 729.
 - large-sized nursery, value, (48) Calif. 533.
 - twigs, abscission among, (42) 140.
 - vinegar, manufacture, (44) 615, 616; (48) U.S.D.A. 13.
 - worm, studies, (49) 452.

Orange-lemon hybrid, analyses, (48) 159.

Oranges—

acidity as affected by sprays, (47) 731.
and milk, value in school lunches, (50) 563.

as affected by alkali, Calif. (42) 640, 819.

beetle attacking, (43) 456.

bud variation in, (47) U.S.D.A. 143.

changes during storage, (50) 239.

cover crops, value, (44) Calif. 737.

culture, (44) V.I. 339; (45) Guam 43.
culture—

experiments, (48) Hawaii 338;
(49) Tex. 436.

in Belgian Kongo, (45) 347.

in Bombay, (43) 745.

in India, (42) 442; (46) 640.

in Sind, (41) 837.

in South Africa, (41) 540.

in Tunis, (47) 344.

digitiform, notes, (43) 818.

dried, used as pepper adulterant, (42) 112.

export from South Africa, (49) 249.

export of South Africa, cause of waste,
(46) 653.

fertilizer experiments, (47) 339.

freezing point, (50) 644.

from Porto Rico, standards, (47) 834.

fumigation experiments, (43) 54.

fumigation schedule, (42) 250.

growth rate, relation to sap concentration, (45) 124.

improvement, (44) 536.

mandarin, resistance to citrus canker,
(48) 248.

mandarin, storage and curing, (45) 838.

navel—

bud selection as related to yield,
(50) 644.

citrus blast affecting, (43) 156.

introduction into United States,
(48) 539.

nematodes affecting, (48) 548.

pruning, (41) 241, 741; (42) 641.

selection, (41) 236.

Platynota tinctana on, (45) 360.

pruning, (49) Calif. 641.

pruning as means of rejuvenation, (42) Calif. 831.

rootstocks for, (44) Calif. 737.

Satsuma—

coloring in Alabama, (49) U.S.
D.A. 743.

in south Mississippi, (50) Miss.
38.

in southern Alabama, (45) 347.

variation in, (42) 537.

varieties, (41) 241.

sour, regeneration of roots, (45) 440.

spraying experiments, (43) 157; (47) Fla. 656.

stocks for, (47) 339.

stocks, nursery practices, (44) 536.

Oranges—Continued.

stored, changes in sugar content, (43) 203.

tissue breakdown in, (47) 248.

value against grasshoppers, (45) 151.

value of sodium nitrate for, (45) Ala.
Col. 45.

variability in size and production of
trees, (42) 140.

variability in yields, casual, (42)
Calif. 819.

variety tests, (47) Calif. 640.

vitamin A in, (50) 59.

Wilder medal recipient, (47) 340.

Orchard fire blight, control, (49) 149.

Orchard grass—

anatomy, effect of potassium salts,
(44) 222.

breeding experiments, (48) Can. 31;
(49) Idaho 732; (50) Can. 433.

culture, (44) 830.

culture experiments, (41) Idaho 225;
(42) 29; (43) Wash. 436; (49) 735.

diseases and pests, (44) 830.

duration in meadows, (50) N.Y.Cornell
231.

fertilizer experiments, (41) 229; (44)
128.

mildew, notes, (44) 48.

seed, marketing, Ky. (48) 129; (49)
892.

seed production, (44) 830; (45) 740;
(48) 441.

seed production maps, (41) U.S.D.A.
236.

Orchard—

heaters, economic use, (44) 740.

heaters, notes, (48) Calif. 535.

heaters, tests, (44) U.S.D.A. 119, 535.

heaters, use, (48) N.Mex. 837.

heating, studies, (49) N.Mex. 532;
(50) U.S.D.A. 807.

heating, test of crude oils for, (49)
Oreg. 533.

horse disease, (43) 473; (49) Wash.
Col. 278.

insects, control, (47) Idaho 254, 849;
(49) 152.

insects in Indiana, (46) 458.

leaf-roller, control, (48) Wash.Col. 553.

leaf-roller, effect of oil sprays, (47)
Wash.Col. 551.

management, (41) Kans. 41, 340, 341,
Mo. 649, Colo. 650; (43) Oreg. 145,
Ind. 337, Ohio 340, Ohio 648, Mich.
649, 833; (44) 41, U.S.D.A. 146,
Kans. 236, Iowa 441, Va. 739, Oreg.
833; (45) Ill. 44, Ind. 133, Me.
639; (46) Wash. 817, 841; (47)
Ind. 138, Iowa 741; (48) Can. 37,
837; (49) Can. 832, Mont. 833; (50)
Mont. 139, Can. 339, 441.

management—

and fertilization, (48) Mass. 341.

in Hood River Valley, (46) Oreg.
234.

in Indiana, (45) 835.

Orchard—Continued.

- management—continued.
 - in Kent, (47) 340.
 - in New York, (43) U.S.D.A. 649.
 - in Nova Scotia, (43) 438.
 - principles, (45) 538.
 - problems, (41) 835.
 - soil erosion in, (44) Ohio 741.
 - pests, (46) 52.
 - pests in Washington State, (50) 844.
 - pests, summary, (42) 748.
 - plant lice, notes, (44) N.J. 349.
 - practices, correlation with growth and production, (50) 37.
 - soils and improvement, (47) Tex. 439.
 - spray machine, equipping for alfalfa fields, (47) 592.
 - spray schedule, (42) 736; (47) 248.
 - stand of trees, (50) 441.
 - surveys of Colorado, (47) Colo. 439.
 - surveys, value to research, (46) 444.
- Orchards—*see also* Fruit, Apples, Peaches, etc.
- alternate bearing, (44) Wis. 41.
 - bird raising in, (46) 741.
 - cost of building, (41) 835.
 - cover crops for, (41) Kans. 41, N.H. 44, Del. 145, Del. 444, Mo. 649; (43) Ind. 338, Pa. 538, Wash. 743; (44) U.S.D.A. 146, Ind. 338, Ariz. 532; (45) Wash. 236; (46) 139; (47) Wash.Col. 535; (49) Wash.Col. 232, Oreg. 534.
 - cover crops in, effects, (47) 832.
 - cover crops in relation to winter injury, (46) Iowa 334.
 - cultivation experiments, (44) Mont. 338.
 - deep subsoiling in Missouri, (42) 482.
 - dusting experiments, (41) 340, 348; (45) Ind. 134, Va. 137.
 - dusting v. spraying, (45) 254.
 - fertilization, (43) Oreg. 145, Ind. 337, Ohio 339, 645, 744; (44) 41, N.Y. State 535, W.Va. 638, Va. 739; (45) Ind. 134, 238; (47) Wash.Col. 535; (48) 38, Ariz. 442; (49) Pa. 232, Wash.Col. 232, Oreg. 532, N.Y. State 534, N.Y.State 535.
 - fertilizer experiments, interpreting results, (43) 645.
 - freeze of 1921, effect, (47) Ohio 143.
 - fumigation, (41) 754.
 - fumigation, daylight, (44) 655.
 - fungicides for, (47) 152.
 - fungus infection in relation to cultivation, (41) 657.
 - hillside, spraying, (47) Ohio 638.
 - home, development, (44) Mont. 638.
 - home, pruning and spraying, (41) Tenn. 444.
 - infection from old isolated trees, (46) 153.
 - irrigated, soil studies, (45) 216.
 - irrigation, (41) 515; (47) Calif. 638.

Orchards—Continued.

- manuring, value, (44) Kans. 236.
 - productivity, relation to temperature, U.S.D.A. (49) 314, 337.
 - pruning experiments, (43) Ohio 339; (44) Kans. 237; (50) Minn. 138.
 - pruning, fundamental principles, (48) 838.
 - rejuvenation, (43) Ohio 647; (45) 137; (48) U.S.D.A. 237.
 - selecting site, (41) N.H. 44.
 - shade crops v. fertilizers, (43) Oreg. 146.
 - sod mulch v. tillage, (49) Ohio 337.
 - spray schedules, (43) N.J. 37, Ohio 339.
 - spraying experiments, (41) Conn.State 158, 657; (42) N.J. 850; (43) Ohio 357; (44) 246, Minn. 753; (45) Ind. 134.
 - spraying experiments, cooperative, (43) 833.
 - war devastated, renovation, (43) 835.
 - winter injury in 1919, (44) Oreg. 821.
 - wood decay in, (44) Oreg. 839.
 - yields as affected by grass, (44) 41.
- Orchestes pallicornis, outbreak, (49) 855.
- Orchid—
- hybrids, Sander's list, (47) 344.
 - leaf spot, studies, (46) 454.
 - mycorrhiza, (49) 424.
 - pest, life history, (41) 853.
 - seeds, nonsymbiotic germination, (48) 223.
 - weevil, notes, (41) Conn.State. 159.
- Orchids, canker fungus on, (44) 842.
- Orchids, indigenous, studies, (42) 728.
- Oregon—
- College, notes, (41) 199, 798; (43) 100, 299, 400; (44) 97; (45) 300; (46) 499, 796; (49) 498; (50) 397.
 - Station, notes, (41) 199; (43) 100, 299; (44) 97; (50) 397.
 - Station, report, (44) 898; (46) 698; (49) 599.
- Organic—
- acids—*see also* Acids.
 - and bases, estimation, (44) 411.
 - effect on hydration and growth, (45) 333.
 - effect upon uric acid excretion, (49) 858.
 - formation by *Aspergillus*, (46) 225.
 - variation during anthocyanin formation, (46) 723.
 - compounds—
 - analysis, (43) 503.
 - analysis and determination of constitution, (49) 501.
 - determination of sulphur in, (49) 203.
 - effect on starch hydrolysis, (49) 10.
 - evolution, treatise, (43) 521.

Organic—Continued.

- matter—
 and organic carbon, simultaneous determination, (45) 614.
 and sulphur content of soil, correlation, (49) Ill. 315.
 bromin determination in, (44) 713.
 chlorin determination in, (45) 414.
 decomposition in soil as affected by root growth, (41) N.J. 28.
 matter, effect on—
 active aluminum, (50) R.I. 17.
 concrete sand, (48) 287.
 growth of water plant, (45) 220.
 hardpan subsoil, (49) Okla. 420.
 nitrogen in fertilizers, (44) 318.
 plants, (45) 820.
 root systems in hardpan subsoils, (47) Okla. 815.
 soil reaction, (41) 319; (46) 118, 211.
 tough soils, (41) 720.
 water-holding capacity of soil, (47) Calif. 618.
 matter—
 for soil, (47) R.I. 725.
 humification in soil, (46) N.Y. Cornell 212.
 in plants, behavior, (46) 324.
 in plants, transportation, (48) 430.
 in soil, (43) 18; (47) Wash.Col. 516; (48) Tex. 514; (50) 815.
 matter in soil—
 carbon content, (46) 709.
 changes in, (48) Fla. 215.
 determination, (49) 804.
 effect of rainfall, (49) Wash.Col. 211.
 effect on productivity, (50) 721.
 effect on seed germination, (41) 523.
 estimation, (46) 709.
 factors affecting, (49) N.Y.Cornell 117.
 maintaining, (47) 216.
 relation to color, (49) Iowa 318.
 relation to solubility, (41) Mich. 512.
 transformation, (46) 813.
 matter—
 inorganic constituents, determination, (44) 114, 712.
 liberation by roots of growing plants, (46) N.Y.Cornell 323.
 loss from soil, (50) Pa. 422.
 nitrogen determination in, (44) 805.
 oxidation, new accelerator for, (48) 313.
 relation to soil fertility, (48) 119.
 solvent effect on rock phosphate, (46) 21.
 value with fertilizers, (47) La. 420.

Organic—Continued.

- mixtures, carbon determination in, (43) 414.
 nitrogen, availability in fertilizers, (50) 196.
 nitrogenous compounds, availability, (48) 821.
 syntheses, treatise, (48) 501; (50) 709.
 wastes, military, value, (44) 725.
 Organism—
 acid-fast, as cause of lymphangitis, (50) 81.
 in unabsorbed yolk of embryonic chick, (48) 883.
 Organisms—*see also* Bacteria and Microorganisms.
 ammonifying in partially sterilized soil, (47) 417.
 atypical, in poultry, (49) R.I. 81.
 chromosome content, (48) 869.
 decomposition of kaolin by, (49) 212.
 immunizing properties, (47) 484.
 in cultivated soils, (49) 212.
 movement of, new method of study, (42) 436.
 pathogenic, air carriage of, (46) 773.
 thermophilic, thermal death point of spores, (45) 10.
 thermophilic, thermal death time curves, (46) 561.
 Orgilus dioryctriae n.sp., description, (41) 63.
 Orgilus gelechiaevora n.sp., notes, (45) 460.
 Orgyia antiqua, life history and habits, (47) 655.
 Oriental moth, parasite of, (49) 657.
 Oriental peach moth, *see* Peach moth, oriental.
 Orientation in plants, studies, (50) 225.
 Orifices—
 hydraulic experiments with, (42) 79.
 suppressed submerged, coefficients of discharge, (48) 384.
 Orites excelsa, studies, (42) 349.
 Ormenis pygmaea, notes, (43) 555.
 Ormenis spp., notes, (47) Conn.State 156.
 Ornithin, synthesis in fowls, (49) 661.
 Ornithodoros—
 crossii, notes, (46) 881.
 crossii, transmission of surra by, (48) 179.
 megnini, *see* Ear tick.
 spp., notes, (49) 157.
 talaje, notes, (48) 482.
 talaje, transmitting agent of relapsing fever, (46) 682.
 Ornithogalum umbellatum, control, (44) Pa. 737.
 Ornithology, British, bibliography, (44) 651; (50) 252.
 Ornithology, early annals, (45) 754.
 Ornithomusca, notes, (47) 555.
 Ornithorhynchus paradoxus, gametogenesis, (48) 567.

- Orobanchaceae and Scrophulariaceae, (47) 126.
- Orobanche spp., studies, (41) 543.
- Orokinase and salivary digestion, (41) 81.
- Orphanina denticaudata, absence of complement in blood, (41) 754.
- Orthezia insignis, life history, (45) 657.
- Orthezia insignis, notes, (41) 661, 662.
- Orthoclase—
potassium in, availability, (49) Pa. 215; (50) 19.
solutions, potassium in, (44) 729.
use as potassic fertilizer, (49) 817.
- Orthoptera—
anatomy and reproduction, (48) 154.
British, monograph, (44) 352.
inheritance in, (46) Kans. 476.
key, (44) 451.
new, from China, (45) 360.
of Maine, (45) Me. 254.
of New England, manual, (44) 58.
of northeastern America, (43) 851.
- Orthopteroid orders, life cycle, (45) 250.
- Orthotylus translucens, life history, (48) 853.
- Ortstein, formation, (44) 213.
- Oryctes—
elegans, notes, (47) 758.
monoceros, life history notes, (48) 753.
rhinoceros, *see* Rhinoceros beetle.
- Oryzanin, effect on beriberi, (48) 564.
- Oscinella frit—
habits, (46) 158.
host plants, (47) 853.
- Oscinis frit—*see also* Frit fly.
in winter wheat, (46) 460.
relation to blindness in oats, (45) 361.
synonymy, (42) 654.
- Oscinosoma frit, parasites of, (50) 255.
- Osler production, treatise, (41) 345.
- Oslerus, new genus, erection, (46) 151; (47) 846.
- Osmosis—
in plant physiology, (45) 29.
in soils, relation to plant growth, (50) 211.
negative, and related phenomena, (44) 823.
rôle in biology, treatise, (46) 126.
- Osmotic—
coefficients, anomalous, (44) 223.
concentration—
effect on absorption rates of seeds, (47) 730.
in desert Loranthaceae, (41) 632.
of ligneous and herbaceous plants, (47) 327; (49) 26.
of tissue fluids, (41) 220, 327.
conditions in plant cells, (48) 126.
pressure—
in mountain plants, (41) 525.
in plants, (47) 30.
in potato plants, (43) 131.
measurement, (46) 631.
of juices from parts of potato plant, (50) 628.
- Osmotic—Continued.
pressure—continued.
of soil solution, (50) 317.
of soil solution and salinity, (42) 131; (47) 812.
rôle in toxicity of salts, (46) 209.
root pressure, and exudation, (46) 431.
values in plants, (42) 49, 228, 629.
values, magnitudes and variations, (45) 124.
- Osteoclasts—
function, (46) 263.
origin, growth and fate, (44) 363.
- Osteomalacia—*see also* Lamziekte.
as affected by parathyroidectomy, (48) 466.
comparison with rickets, (42) 777.
hunger, in Vienna, (46) 568; (50) 568.
in cattle, (49) 179.
in cattle in Norway, (50) 185.
relation to undernutrition, (43) 667.
- Osteoporosis, relation to undernutrition, (43) 667.
- Osterdamia matrella, notes, (41) Fla. 528.
- Ostertagia—
circumcincta in sheep, (46) 685.
ostertagi in cattle, (44) 880.
ostertagi, notes, (49) 786.
- Ostraea bengalensis, notes, (49) 154.
- Ostrich diseases, (42) 681.
- Ostrich eggs, absence of xenia in, (43) 776.
- Ostriches, breeding in North Africa, (42) 560.
- Ostriches, inheritance of acquired characters, (46) 573.
- Otiobiosis, review of literature, (49) 455.
- Otiobiosis, studies, (49) 157.
- Otiobius megnini, review of literature, (49) 455.
- Otiobius megnini, studies, (49) 157.
- Otiiorhynchid weevils of Florida, specific names, (46) 560.
- Otiiorhynchus—
ovatus, control, (49) 848.
ovatus, popular account, (46) 159.
ovatus, summary, (47) 758.
rotundatus, life history, (46) 51.
spp., summary, (48) West.Wash. 254.
sulcatus, notes, (41) 59; (49) 50.
- Otoba butter, analyses, (45) 311.
- Otocariasis of foxes, (50) Minn. 153.
- Otocephaly in guinea pigs, (50) 527.
- Otodectes cynotis, notes, (50) Minn. 153.
- Otosclerosis, notes, (49) 462.
- Otters, treatise, (50) 355.
- Ova, resorption of, (42) 763.
- Ova, tumefied, in the hen, (44) 881.
- Ovarian—
follicle of guinea pig, growth, (41) 768.
grafts in goats and ewes, (47) 573.
hormones, effect on growth of pelvis, (45) 168.
tissue, retention by male birds, (41) 269.

Ovaries—

- as affected by underfeeding, (41) 862.
- behavior toward acid-azo stains, (41) 174.
- concrecence of follicles, (41) 862.
- guinea pig, grafted on males, histology, (41) 173.
- internal secretions, (44) 468.
- mammalian, types, (50) 826.
- of cows, anatomy and diseases, (45) 885.
- relation to uterus and mammary gland, (41) 174.

Ovary—

- and uterus, physiological correlation, (48) 869.
- bovine, anatomical development, (49) 781.
- of a hen, haematoma, (44) 881.

Overtitration, device for preventing, (42) 313.

Oviserum, use of term, (42) 777.

Ovular pistillody, studies, (44) 630.

Ovulariopsis—

- n.spp. from West Indies, (46) 239.
- papayae n.sp., description, (47) 154.

Ovulation—

- and blood sugar, relation, (50) 867.
- as affected by corpus luteum, (41) 175.
- effect of hypophyseal substance, (47) 69.
- effect of underfeeding, (44) 173.
- effect on blood sugar of pigeons, (48) 273.
- relation to suprarenals, (48) 167.

Owl, little, food and feeding habits, (47) 755; (49) 251.

Owls, chicken-eating, catching, (47) Md. 73.

Owls in California, (47) Calif. 549.

Ox bile sensitization in mouse typhoid infection, (49) 79.

Ox blood, nature of sugar in, (49) 715.

Ox cecum, development, (42) 179.

Ox, edible tissues, vitamin B in, (49) U.S.D.A. 63.

Ox hair, microscopic studies, (47) 81.

Ox muscle, diamino acid content, (47) 610.

Ox warble fly—*see also* Hypoderma spp. and Warble flies.

notes, (41) 280, 755.

preventive treatment, (46) 684.

Ox warbles—

- agricultural importance, (43) 853.
- control, (49) 657.
- larval stages, (45) 555.
- life history, (42) 854.

Oxalates in plants, (43) 730.

Oxalates, specific colored reaction, (41) 504.

Oxalic acid—

- color test for, (44) 313.
- detection in distinction from tartaric acid, (44) 113.
- determination in fruit juices, (49) 805.
- in plants, (45) 528.
- in sugar cane, (44) 201.

Oxalic acid—Continued.

production from alkali-sawdust fusion, (41) 314.

production, mechanism, (43) 112.

Oxalidaceae-Turneraceae of Mexico, (49) 837.

Oxen—

- care in health and disease, (49) 377.
- growth estimation, (43) 371.
- of Morocco, tests, (41) 368.

Oxidase—

- acting upon phlorizin, (46) 825.
- activities of plants, (41) Del. 132.
- activity, apparatus for measuring, (44) 29.
- activity of apple bark as affected by salts, (44) 426.
- activity within plants, (44) Del. 424.
- apparatus, description, (42) 412.
- of fresh and dried vegetables, (41) 202.
- relation to tumor tissues, (45) 647.

Oxidases—

- and diastases, relation to nitrogen starvation, (42) 144.
- connection with improvement of plants, (42) 27.

Oxidation—

- and reductions in animal body, treatise, (48) 411.
- effect on vitamin C, (45) 466.
- in soil, effect of plant growth, (47) 212.
- in soil-forming rocks, effect of chemical agents, (49) 617.
- increase by muscular work, cause, (47) 167.
- respiratory, in leaves, (42) 129.

Oxido-therapy, review of literature, (45) 785.

Ox-marrow and ox-tail fats, digestibility, (41) U.S.D.A. 65.

Oxycarenus laetus, notes, (47) 357.

Oxycarenus luctuosus, notes, (49) 758.

Oxygen—

- absorption in respiration, apparatus for demonstrating, (46) 432.
- and perforations in canned fruits, (49) 856.
- atmospheric, solution by water, (41) 321.
- consumption during running, (48) 859.
- consumption, effect of vitamin deficiency, (49) 767.
- consumption, measuring, (41) 524.
- content of bog water, effect of cloudiness, (46) 632.
- deprivation, effect on plants, (45) 333.
- dissolved, determination, (50) 201.
- small amounts of, measuring, (47) 714.
- supplying power of soils, determination, (50) 22.

Oxygrapha comariana, life history, (44) 254.

Oxytropis lamberti, identification, (42) 776.

Oxyurus curvula as affected by thymol, (46) 885.

Oyster shells v. limestone, feeding value, (47) Md. 73.

Oysters—
 copper in, (44) 556.
 culture, (45) N.J. 378.
 food and growth, N.J. (46) 576; (48) 374.
 inspection, (47) Conn.State 559.
 purification, (45) 561.
 spoilage due to pink yeast, (42) U.S. D.A. 860; (43) 663.
 vitamin C in, (50) 465.
 zinc and copper in, (41) 464.
 zinc distribution in, (46) 260.

Oyster-shell scale—
 control, (45) 852.
 different forms, (47) 851.
 forms, in Illinois, (43) 356.
 in South Dakota, (41) 59.
 notes, (42) 748.
 parasites of, (42) 154.

Ozone—
 atmospheric, absorption of ultra-violet rays by, (50) 315.
 effect on vitamin A, (45) 564.
 in air as affected by rain, (44) 508.
 in upper air, rôle in plant and animal life, (50) 208.

Ozonium omnivorum—
 habits, (50) 747.
 notes, (41) Ariz. 345; (43) 652; (50) Tex. 45.
 studies, (42) 449; (49) 246, Tex. 442.

Pachira insignis, durability test of wood, (43) 44.

Pachnaeus litus on strawberries, (47) 556.

Pachnaeus, specific names, (46) 857.

Pachymerus sp., parasite of, (49) 256.

Pachynematus clitellus, notes, (49) 256.

Pachyneuron coccorum, notes, (43) 252.

Pachyneuron spp., parasitism by, (44) Va. 756.

Pachycrepoideus dubius, notes, (50) 359.

Pachypappelia new name, (43) U.S.D.A. 758.

Pachyschelus laevigatus, notes, (47) 658.

Pachyzancla bipunctalis, notes, (45) V.I. 150.

Pachyzancla periusalis, notes, (49) 53, 759.

Packers and Stockyards Act, (47) U.S.D.A. 393; (48) 93.

Packing plants, state ownership, (45) 595.

Pacol, grading, baling, and inspection, (50) 434.

Paddy, *see* Rice.

Padraona hypomoloma, notes, (42) 751.

Pageant for rural schools, (50) 95.

Pagophila eburnea v. P. alba, (42) 355.

Pahvent Valley plague, studies, (42) 476.

Paint—
 as plastic material, (42) 890.
 bulletin, (45) N.Dak. 318.
 cold water, preparation and use, (46) 688.
 films, stress-strain measurements, (46) 586.

Paint—Continued.
 for irrigation structures, (44) 687.
 fungi injurious to, (46) N.J. 554.
 ingredients and mixing, (48) 186.
 manufacture and sale, laws regulating (48) 784.
 methods of analysis, (41) 314.
 plasticity, (49) 287; (50) 686.
 protection for wood, (47) 687.
 protective value on steel, (43) 283.
 red lead in, treatise, (46) 688.
 use on the farm, experiments, (42) 591.
 white-lead, for control of apple tree borer, (43) U.S.D.A. 762.

Painting, principles and practices, treatise, (50) 590.

Paints—
 chemistry of, progress, (41) 614.
 suitable for bridges, list, (43) 284.
 tests, (47) 390; (49) 385.

Paivaia langsdorffi, possible economic value, (43) 40.

Palatoeceticus gloverii, unusual outbreak, (49) 759.

Palau laboratory ware, (41) 11.

Paleopus dioscureae, notes, (43) 258.

Pales weevil, life history and control, (46) 253.

Palite, action on plants, (45) 28.

Palm—
 bleeding disease, (42) 741.
 Bourbon, and its fiber, (42) 531.
 bud rot in southern India, (50) 552.
 disease survey in India, (46) 544.
 gul manufacture, (43) 808.

kernel—
 cake, analyses, (42) 770; (46) Can. 168.
 cake, composition and use, (44) 363.
 cake, rancidity, (41) 10.
 cake, sugar in, (43) 671.
 fat, determination, (41) 412.
 meal, analyses, (41) Ind. 564, Ind. 868; (45) 872.
 meal, vitamin in, (50) 64.
 oil, digestibility, (42) 552.
 oil, iodine value, (41) 412.
 oil, steam-distilled, vitamin A content, (46) 256.
 proteins, growth-promoting value, (50) 64.

leaf spots, (46) 647.

nipa, economic uses, (42) 142.

nut cake and meal, analyses, (47) 865.

nut cake, feeding value, (50) 367.

nut meal, feeding experiments, (47) 671.

oil—
 and wheat middlings, analyses, (41) N.Y.State 868.
 as fuel for burners, (47) 90.
 as motor fuel, (45) 185, 690; (47) 90; (49) 590, 688.
 evaluation, (41) 115.

Palm—Continued.

oil—continued.

- extracting methods, (44) 147.
- free fatty acids in, (45) 720.
- manufacture, model factory for, (45) 720.
- motors, (45) 588.
- production, (42) 43; (46) 636.
- refining, (47) 207.
- substitutes for in tin plate manufacture, (42) 508.
- vitamin A in, (49) 59.
- pit borer on oil palm, (44) 855.
- sirup manufacture, (44) 807.
- Supari, koleroga disease, notes, (50) 243.
- weevil, notes, (45) 859.

Palmodes praestans and its prey, (41) 252.

Palms—

- and palm products of Philippines, (43) 443; (48) 842.
- date, *see* Date palms.
- insects affecting, (50) 51.
- of Kongo, (45) 350.
- of Philippines, (41) 837.
- oil, *see* Oil palms.
- ornamental, notes, (43) U.S.D.A. 339.
- production in French colonial possessions, (42) 32.

Palmyra bud rot, notes, (42) 145, 741; (43) 445.

Palomaria oil, hydrogenation, (50) 309.

Palpostoma desvoidyi n.sp., description, (48) 855.

Pan American Scientific Congress, notes, (50) 700.

Panama climate, (49) U.S.D.A. 719.

Pancreas—

- action as affected by thyroid, (44) 669.
- and parathyroids, relation, (50) 765.
- changes in deficiency disease, (43) 664.
- in polyneuritic pigeons, diastatic enzyme in, (48) 761.
- in rats, growth in weight, (42) 559.
- preparations, proteolytic activity, (42) 202.
- relation to diabetes, (43) 370.

Pancreatic—

- amylase, purifying, (44) 309.
- disorder in rickets, (47) 665.
- enzymes, deterioration, (45) 715.
- secretion and acid tide, (49) 560.

Pandora moth, notes, (49) 655.

Panicum—

- barbinode, notes, (42) U.S.D.A. 340.
- frumentaceum, smut affecting, (49) 839.
- obscurans, for paper making, (42) 531.
- spp., analyses, (50) 168.

Pans in soil, formation, (48) 117.

Pansies, culture, treatise, (44) 45.

Pantomorus fulleri, notes, (48) 854.

Papaipema—

- cataphracta, notes, (45) 759.
- nitela, *see* Stalk borer.

Papaver—

- latex vessels, function, (43) 525.
- rheoas, inheritance of flower characteristics, (42) 630.

Papaw—

- diseases, notes, (41) 450.
- powdery mildew, cause, (47) 154.
- snout beetle, notes, (41) Fla. 549.

Papaya—

- disease, notes, (43) 445, 652.
- foot rot, notes, (44) 445.
- fruit disease, notes, (45) 842.
- fruit fly, biology, (48) U.S.D.A. 56.
- leaf blight, control, (44) 247.
- leaf spot, notes, (46) 544; (47) 846.
- powdery mildew, cause, (47) 154.
- rot, notes, (46) 454.
- vitamin C in, (49) 563.

Papayas—

- anomalies of development, (43) 818.
- antiscorbutic value, (47) 568.
- breeding experiments, (46) 735.
- coconut bud rot on, (43) 156.
- culture, (44) Hawaii 44, V.I. 339; (45) Guam 43.
- culture experiments, (41) 650; (42) 736; (43) 40; (48) Hawaii 338, V.I. 340.
- culture in Belgian Kongo, (45) 347.
- fertilizer experiments, (42) Guam 37.
- from home-grown seed, (46) Guam 733.
- fungus attacking, (44) 150.
- preserving, (44) Hawaii 16.
- studies in India, (46) 640.
- use in chicken yards, (42) Guam 65.
- variety tests, (46) Hawaii 640.

Paper—

- binding twine, tests, (45) 186.
- diseases, (46) 455.
- dress form for dressmaking, (46) U.S.D.A. 792.
- estimation of fibers in, (42) 12.
- industry, discussion, (43) 317.
- making—
 - bagasse for, (41) 806.
 - chemistry of, (41) 613; (43) 409.
 - industry in Canada, (41) 840.
 - alang grass for, (41) 532.
 - materials, (42) 531, 840.
 - materials, classification, (45) 511.
 - materials from cotton, (41) 734.
 - materials of Brazil, (41) 827.
 - materials of Philippines, (41) 732.
 - materials of South Africa, (41) 529.
 - possibilities of grasses, (43) 317.
 - rice by-products for, (41) 533.
 - suitability of flax and hemp chaff, (42) 417.
 - suitability of various woods for, (50) 142.
 - vegetable fibers in, (42) 116.
- mill roofs, wood-destroying fungi in, (44) 651.

Paper—Continued.

mulches on sugar cane, (44) 437.
pulp—*see also* Pulpwood and Wood pulp.

feeds, composition and digestibility, (45) 170.

hemp and wood fibers in, estimation, (50) 509.

manufacture from bamboo, (44) 743.

materials, (42) 44.

materials, Philippine, (43) 841.

possibilities of manufacture in Australia, (42) 116.

production from megasse, (47) 113.

research literature of Forest Products Laboratory, (42) 12.

tearing resistance, (42) 116.

Papilio—

demoleus, invisibility during flight, (45) 657.

polytes, female forms, (47) 358.

polytes, notes, (45) 657.

polyxenes, notes, (41) U.S.D.A. 462; (45) Conn.State 149.

zolicoon on orange trees, (47) 553.

Papilionaceae, bacteria in root nodules, significance, (45) 525.

Pappea capensis seeds, oil from, analyses, (43) 801.

Pappea meal, analyses, (43) 802.

Paprikas, changes in composition during growth, (46) 501.

Para cymene, utilization, paper on, (42) 205.

Para grass—

composition and feeding value, (48) 67.
culture and feeding value, (46) Guam 440.

effect on coconut, (49) Guam 427.

feeding value, (42) Guam 64.

manuring experiments, (45) Guam 33.
notes, (42) U.S.D.A. 340.

Para rubber, *see* Rubber.

Parabiosis—

heterosexual, changes in reproductive organs, (46) 265.

in study of deficiency diseases, (50) 858.

Parabortion, immunizing agent against paratyphoid, (42) 274, 568.

Paracalocoris—

hawleyi, studies, (41) N.Y.Cornell 161.
notes, (42) 154.

Paraceraptoerus—

africanus, notes, (45) 459.

new genus, erection, (45) 459.

Paraclemensia acerifoliella, notes, (48) 54; (49) N.Y.Cornell 355.

Paracopidosomopsis floridanus, polyembryonic broods, (42) 656.

Paracopidosomopsis, studies, (41) 853.

Paracrias phytomyzae, notes, (50) 661.

Paradexodes epilachnae n.sp., description, (49) 453.

Paradichlorobenzene—

as fumigant in entomological museum, (48) 652.

as grain fumigant, (50) Minn. 152.

as soil fumigant, (47) 360.

effect on cane and cane grubs, (48) 58, 753.

for peach borer control, (45) 758; (46) 156, N.J. 156, U.S.D.A. 156; (47) Ohio 162, 256, Mich. 455; (48) N.J. 354, 553, Mo. 650; (49) N.Y.State 53, 152, Okla. 450, Ind. 548, Ky. 549, Mo. 555, U.S.D.A. 851; (50) Conn. State 50, 155, N.J. 455, N.Y.State 555.

for root-eating cane grubs, (50) 457.
insecticidal value, (44) U.S.D.A. 162; (48) Ky. 356.

Paradriss n.sp., parasitism by, (47) S.Dak. 451.

Paraffin, use in wound treatment, (41) 83, 475.

Paragonimus compactus, redescription, (49) 499.

Paragonimus genus, notes, (49) 499.

Paragordius varius, parasitism by, (47) S.Dak. 451.

Paraguay kernels, oil from, (43) 240.

Paragus spp., notes, (42) 854.

Paralipsa gularis on stored peanuts, (42) 453.

Paralysis—

bulbar, in cattle, (48) 181.

due to ticks, (50) 762.

in avian polyneuritis, nature of, (46) 669.

in children due to wood ticks, (46) 59.

lumbar, in goats, (48) 882.

nature of, in beriberi-like diseases, (47) 268.

partial, in swine, prevention, (49) Ohio 371.

preparturient, of sheep, (42) Calif. 883.

Paramecium, metabolic activity of, effect of vitamins, (42) 662.

Parana pine lumber industry of Brazil, (50) 40.

Paranagrus osborni, parasitism, studies, (42) 249.

Paraphelinus and Centrodora, synonymy, (41) 360.

Paraphorocera senilis—

larval characters, taxonomic value, (47) 555.

parasitism by, (43) 858.

Parasetigena platensis, parasitism by, (47) 657.

Parashorea malaanonan wood, properties, (49) 143.

Parasites—*see also* Animal parasites, Insect parasites, and specific forms.

and parasitic diseases of sheep, (49) U.S.D.A. 786.

cryptogamic, of plants, (46) 448.

eggs, detecting in feces, (48) 383.

Parasites—Continued.

- hymenopterous, new species, (43) 662.
- imported, refrigerator for shipping, (50) 657.
- internal, diagnosis and treatment, (49) 482.
- intestinal, of animals, (46) 685.
- introduced, retarded establishment of, (50) 845.
- introduction in Porto Rico, (48) 360.
- of animals in slaughterhouse, (46) 882; (49) La. 283.
- of cattle, (45) 77.
- of foxes, list, (46) 686.
- of hematophagous invertebrates, (48) 649.
- of sheep and goats, (45) Tex. 483.
- of wild rats in England, (48) 549.
- oscillatory, of intestines of man and animals, (49) 400.
- vegetable, of cultivated plants, (50) 244.
- Parasitic infections, eosinophilla in, (47) 285.
- Parasitism—
 - and symbiosis, (46) 655.
 - in plants, studies, (43) 46.
 - physiology of, (45) 749; (47) 349; (48) 842, 843; (49) 240.
- Parasitology—
 - atlas of, (49) 177.
 - handbook, (49) 76.
 - human, treatise, (44) 577.
 - treatise, (48) 774.
- Parasplomicrus froggatti n.g. and n.sp., life history notes, (48) 256.
- Paratetranychus—
 - bicolor, notes, (50) Conn.State 50.
 - citri, *see* Citrus red spider.
 - heteronychus n.sp., description, (47) 558.
 - pilosus, control, (47) Conn.State 155; (48) Calif. 461, 857.
 - pilosus, notes, (42) 456; (45) Conn. State 149, Conn.State 259; (46) 753; (47) 558, Idaho 763; (48) 654, 852; (49) Ohio 352; (50) Conn.State 851.
 - sp., notes, (47) 758.
 - ununguis, notes, (48) 556; (50) Conn. State 50.
- Parathyroid—
 - feeding, effect, (47) 373.
 - glands, effect of calcium deficiency, (50) 162.
 - glands, effect on carbohydrate metabolism, (42) 557.
 - glands, effect on growth, (48) 870.
 - glands, review of literature, (45) 770.
- Parathyroidectomy, effect on skeleton of animals, (48) 466.
- Parathyroids and pancreas, relation, (50) 765.
- Parathyroids and thyroids, relation, (44) 670.
- Paratrigonogastra stella, notes, (45) 459.
- Paratyndaris coursetiae n.g. and n.sp., (41) 259.

Paratyphoid—

- abortion in mares, (42) 273, 568.
- B, bacterial action of plasma and serum toward, (44) 181.
- B, epidemic among rabbits, (44) 680.
- B, epizootic among guinea pigs, (47) 183.
- bacilli—
 - differentiation, (43) 785.
 - from chicks, (44) 683.
 - from swine, observations, (42) 881.
 - in horses, (45) 585.
 - viability in excrement, (46) 588.
- C, studies, (43) 685.
- enteritidis—
 - bacilli, diagnostic media for, (42) 882.
 - group, development in food, (47) 771.
 - group, studies, (41) 580; (43) 275; (47) 170.
 - in mice, microbic virulence and host susceptibility in, (49) 882.
 - fever immunization, oral route for, (50) 478.
 - infection, cause of meat poisoning in sheep, (42) 273.
 - of calves, (48) 678.
 - of fowls, (50) 586.
 - of honeybees, (47) 259, 260.
- Parexorida caridei, notes, (47) 657.
- Parexorida caridei, parasitism by, (45) 854.
- Paria canella—*see also* Strawberry root-worm.
 - quadrinotata and gilvipes, summary, (50) U.S.D.A. 55.
- Paridris brevipennis, notes, (43) 259.
- Paridris n.sp., parasitism by, (44) 652.
- Parinarium seeds, oil from, analyses, (47) 803.
- Paris green—
 - analyses, N.J. (43) 37; (44) 440.
 - as anopheline larvicide, (49) 55.
 - insecticidal value, (43) Colo. 158.
 - new preparation, (47) 758.
 - tests, (41) Wis. 661.
- Parks—
 - and gardens, treatise, (42) 539.
 - and reserves in Maryland, (43) 651.
 - history and utility, (42) 539.
 - in Canada, (48) 43.
 - national, descriptive accounts, (41) 651; (42) 738.
 - natural, origin, (46) 28.
- Parlatoria blanchardi, notes, (47) 758.
- Parmelia molliuscula, chemical examination, (49) Wyo. 476.
- Parnara mathias on rice, (42) 451.
- Parrots, care and management, (48) 250.
- Parserina leaves, behavior during drought, (48) 625.
- Parsley—
 - culture, (44) Alaska 532.
 - culture experiments, (48) V.I. 340.

Parsley—Continued.

- disease, undescribed, (47) 838.
- Phoma root rot, notes, (47) Mich. 447.
- seeds, feeding value, (42) 369.
- vitamin B in, (47) 267.

Parsnip—

- diseases, notes, (41) 154, 155.
- Phoma root rot, notes, (47) Mich. 447.
- webworm, notes, (43) Conn.State 252; (45) 759.
- webworm on corn, (42) Ohio 852.
- webworm, parasite of, (44) 655.

Parsnips—

- Bacillus botulinus on, (44) 763.
- culture, (44) Alaska 532.
- culture experiments, (49) Alaska 435.
- lime requirements, (46) R.I. 233.
- variety tests, (42) Minn. 835.

Parthenogenesis—

- in *Apanteles glomeratus*, (42) 156.
- in grouse locust, (42) 768.
- in pear-slug sawfly, (43) 60.
- occurrence and causation, (46) 222.

Partitions, sound-proof, (47) 191.

Paspalum—

- culture and feeding value, (46) Guam 440.
- dilatatum, feeding value, (42) Guam 64.
- dilatatum infected with ergot, effect on cattle, (44) 78.
- grass, propagation, Guam (45) 34; (49) 427.
- notatum, notes, (41) Fla. 528.

Passerculus rostratus, subspecies, (41) 547.

Passerella, revision of genus, (44) 56.

Passerherbulus lecontei (caudacutus), synonymy, (41) 547.

Passeromyia, notes, (47) 555.

Passion vine beetle, notes, (41) 555.

Pasteur, L.—

- and his work, treatise, (48) 673.
- biography, (45) 680.
- editorial, (48) 401.

Pasteurella ovissepticum, notes, (49) 681.

Pastoral life in French Alps, (49) 390.

Pasture—

- and hay mixtures, comparison, (50) Can. 433.
- and pork production, (47) Mich. 697.
- crops—
 - climatic requirements, (41) U.S.D.A. 417.
 - for Nova Scotia, tests, (41) 729.
 - for Ontario, tests, (41) 333, 334.
 - notes, (45) Wis. 271.
 - tests, (41) Nebr. 434.
- experiments, cooperative, (43) Ind. 331.
- experiments with dairy stock, (42) U.S.D.A. 370.
- grass, effect of burning, (44) Kans. 225.
- grasses, useful, (50) 434.

Pasture—Continued.

- mixtures, notes, Oreg. (44) 826; (49) 526.
 - plants as affected by grazing, (49) U.S.D.A. 866.
 - plants, length of life, (50) N.Y.Cornell 230.
 - soils of upper Jura, flora and fertilizers, (49) 511.
 - v. barn for finishing steers, (43) Ky. 373.
 - v. crops, relative labor income, (43) 92.
- Pastures—*see also* Grassland and Meadows. and pasture plants of New Zealand, handbook, (45) 127.
- botanical composition, (46) 129.
 - botanical composition as effected by fertilizers, (41) 322.
 - carrying capacity and renovating, (48) W.Va. 168.
 - cocksfoot, in New Zealand, (41) 640.
 - cut-over land, (41) Minn. 387; (44) Wash. 33.
 - dry land, feeding value, (49) Mont. 170, U.S.D.A. 371.
 - effect of burning, (49) 224.
 - effect of smoke pollution, (44) 431.
 - establishment after forest fires, (46) 142.
 - fertilizer experiments, (42) 720; (45) Ohio 126, 622; (46) 624; (47) Pa. 429; (49) Ohio 733; (50) 322.
 - for northern Georgia, (48) 435.
 - grazing and fertilizer tests, (46) 227.
 - improvement, (44) 227, 526; (46) 436; (48) 228; (49) N.H. 329, Ohio 329.
 - improvement and maintenance in Great Britain, (42) 106, 168, 734.
 - improvement in Morocco, (42) 230.
 - improvement in Rhodesia, (43) 638.
 - in Cyrenaica, (42) 540.
 - in France, treatise, (42) 437.
 - in Madagascar, (44) 267.
 - in wheat-growing districts of New South Wales, (46) 638.
 - insect fauna, (45) 358.
 - irrigated, carrying capacity, U.S.D.A. (46) 771; (49) 875.
 - irrigated, for hogs, (41) U.S.D.A. 72.
 - management, (42) Va. 437; (43) Wash. 436; (47) Del. 432.
 - management in Kansas, (41) Kans. 34, 367.
 - management in Netherlands, (41) 638.
 - mixed-grass, for dairy cows, (43) U.S. D.A. 468.
 - mountain, of Italy, (45) 894.
 - mowing experiments, (49) U.S.D.A. 867.
 - native range, of North Dakota, (41) 435.
 - nitrogen fertilization, effect on milk production, (47) 816.
 - nitrogen fertilization experiments, (50) 122.
 - of New Zealand, flora, (44) 670.

Pastures—Continued.

- of West Virginia, (50) W.Va. 867.
- old, improvement, (46) 437.
- on peat soils, grass mixtures for, (42) 733.
- overgrazing, detection, (47) 540.
- permanent, for Georgia, (45) 736.
- Rhizoctonia in, (42) 243.
- seeding, (41) Mont. 37.
- seeding method, (49) U.S.D.A. 630.
- studies, (49) Miss. 428, Can. 734.
- temporary, in England and Wales, (41) 529.
- top-dressing experiments, (47) 420.
- v. soiling for cows, (49) Mont. 172.
- weed control in, (50) 338.
- wire fences for, (42) 282.

Patchia virginiana n.g. and n.sp., (43) U.S.D.A. 758.

Patellaria theobromatis, notes, (45) 653.

Patellina fragariae, synonymy, (48) 848.

Path coefficients, theory, (44) 766; (48) 661.

Pathology—

- and genetics, relation, (50) 328.
- exotic, (49) 499.
- textbook, (50) 180.

Patola, culture directions, (45) 35.

Patton, W. H., biography of, notes, (45) 259.

Pauridia (n.g.) *peregrina*, notes, (43) 662.

Pavement—

- slabs, rigid, warping, (50) 790.
- types, costs in Philadelphia, (44) 85.
- wood block, relative wear, (46) 780.

Pavements—*see also* Concrete and Roads.

- and trucks, paper on, (44) 380.
- Arpax ruby, (42) 385.
- bituminous, on old macadam streets, (45) U.S.D.A. 290.
- brick, construction, (44) 380.
- brick, monolithic, mileage tests, (42) 578.
- brick, standard specifications, (42) 891.
- concrete, reinforcing, (43) 790.
- concrete, vertical movements, (41) 689.
- construction, treatise, (44) 784.
- design, subgrade support in, (44) 885.
- distribution of wheel load on, (47) 591.
- for heavy traffic, design, (44) 784.
- impact tests, U.S.D.A. (46) 186, 285.
- rigid, temperature stresses in, (44) 285.
- rural, types, (44) U.S.D.A. 884.
- treatise, (42) 279.
- wood-block, studies, (41) 790.

Paving block, granite, laboratory tests, (43) 85.

Paving oil for wood preservation, (47) 290.

Pea—

- anthracnose, notes, (47) Wis. 446; (50) 146.

Pea—Continued.

aphid, control, (48) U.S.D.A. 457, 854; (49) Wis. 653; (50) 557.

aphid, nicotin sulphate dust for, (44) U.S.D.A. 652.

bacterial blight, notes, (41) Ariz. 332; (48) 244.

bacterial disease, notes, (50) S.C. 648.

bacteriosis, notes, (44) 842.

blight, notes, (44) 643, Calif. 744, 845.

blooms, color factors in, (46) 433.

bran, analyses, (46) Mich. 168; (48) Can. 368.

bran, inspection and analyses, (42) Mich. 63.

cannery inspection, reporting, (48) U.S.D.A. 61.

chink, life-history and control, (42) 851.

chink on cotton, (41) 251.

diseases, (41) 51, 745; (44) 642, 748; (45) 649; (47) Calif. 646; (48) N.J. 145.

forage, comparison, (47) Wash.Col. 575.

Fusarium diseases, studies, (41) Minn. 745.

hay, yields, (45) Miss. 223.

heart rot or black pit, (41) 451.

leaf blotch, notes, (44) 842.

louse, green, in New Jersey, (41) N.J. 255.

meal, analysis, (41) 868.

meal as source of protein for hens, (49) Idaho 777.

mildew, notes, (46) 741.

moth—

control, (43) Wis. 257; (44) Wis. 249, 252.

importance, (47) Wis. 452.

injury, prevention, (47) 551.

life history, (43) 850; (44) 252.

new species, (44) 252.

studies, (43) Wis. 257; (45) 154, Wis. 252.

synonymy, (48) 854.

root rot, notes, (44) Conn.State 150; (46) 543, Del. 646; (50) 839.

root tips, excised, cultivation under

sterile conditions, (49) 627.

seed, vitamin A content, (46) 357.

seed weight, relation to resulting crop, (50) 636.

seeds, iron and manganese content, (49) 202.

seeds, manganese in, (49) 731.

stem rot, notes, (45) 842; (50) 839.

straw—

analyses, (44) Wash. 471.

digestibility, (43) 569.

for fattening cattle, (43) 870.

for sheep, (43) Wash. 772.

hydrolyzed, feeding value, (48) 265, 871.

tree, meloid pest, (41) 259.

vine meal, feeding value, (42) 369.

Pea—Continued.

- weevils, notes, (41) N.C. 660, 759.
- weevils, summary, (48) U.S.D.A. 359.
- wilt, notes, (43) 444; (44) 842.

Peach—

- abnormalities, notes, (45) 842.
- anthracnose, varietal resistance, (46) 243.
- aphid, green—
 - biology and natural enemies, (48) 253.
 - control, (41) 662; (50) 557.
 - in New Jersey, (41) N.J. 255.
 - on spinach, (41) Va.Truck 663; (50) Pa. 453.
 - parasite of, (48) 753.
 - toxicity of tobacco dust to, (49) N.Y.State 552.
- aphid, Indian, notes, (43) 852.
- aphids, control, (47) Idaho 759; (49) N.C. 757.
- as short-season fruit, (43) U.S.D.A. 595.
- bacterial leaf spot, notes, (43) Okla. 36.
- bark, spotting, (48) Calif. 541.
- blight, notes, (41) Mo. 650; (44) 642; (48) 50.
- blossom blight, notes, (44) Del. 444, 648; (46) 543; (47) 355.
- borer, control, (41) Del. 157; (42) 54, N.J. 849; (43) 359, Pa. 554; (44) N.J. 349; (45) 758; (46) 156, N.J. 156, U.S.D.A. 156; (47) Ohio 162, 256, 360, Mich. 441, Mich. 455; (48) N.J. 354, 553, Mo. 650; (49) N.Y.State 53, 152, Okla. 450, Ind. 548, Ky. 549, Mo. 555, N.C. 757, U.S.D.A. 851; (50) Conn.State 50, 155, 453, N.J. 455, N.Y.State 555.
- borer, emergence records in Pennsylvania, (49) 852.
- borer, mechanical protectors for, (46) N.J. 556.
- borer, notes, N.J. (41) 58, 61; (42) 835; (44) 353.
- borer, studies, (46) S.C. 747.
- brown rot, control, (41) 348; (43) 238; (44) Mich. 144, Ohio 750; (45) Miss. 139; (46) Mich. 552; (47) Conn.State 140, U.S.D.A. 441, Mich. 450; (49) Conn.State 534; (50) 450, 552.
- brown rot, notes, (41) N.J. 54; (43) 349; (47) Calif. 649; (48) N.J. 345, Del. 642; (49) 45, 442, 445.
- bud rot, notes, (50) 842.
- buds—
 - analyses, (45) Mo. 221.
 - dormancy and winterkilling, (46) 338.
 - freezing, (45) 320.
 - moisture content, (47) 809.
 - moisture content as index of hardness, (43) 39.

Peach—Continued.

- buds—continued.
 - moisture index in winter and spring, (50) Md. 126.
 - undercooling, (47) 239; (49) 220.
- canker, cause, (43) Can. 847.
- canker, control, (41) 655; (43) 847; (49) Can. 839.
- crown gall, notes, (43) 246; (44) 346; (46) 543.
- curculio, control, (43) 238, 743; (44) Mich. 144; (45) Miss. 139; (47) U.S.D.A. 440.
- curculio, notes, (49) N.C. 757.
- die-back, notes, (44) 49, Conn.State 150.
- diseases and pests, remedies, (45) Wash. 44.
- diseases, control, (43) Ill. 847; (44) Wash. 53; (46) Ga. 553.
- diseases, parasitic, during 1915-1920, (49) 445.
- foliage, injury from sprays, (47) Mass. 646.
- Fusarium rot, notes, (44) 842.
- heart rot, notes, (44) 648; (48) 147.
- industry in United States, (42) U.S.D.A. 345.
- jam, preparation, (44) N.J. 359.
- June drop, (46) Del. 651.
- leaf curl, control, (41) 54, 349; (43) 446; (45) 48; (47) 49, Mich. 449, 844; (49) N.Y.State 49; (50) 451.
- leaf curl in Great Britain, (45) 356.
- leaf curl, notes, (42) 146, 153; (43) 246; (44) 346, 446, 642, Oreg. 839, Oreg. 840, Oreg. 841; (45) 48; (46) 453, 646, 741, 844; (49) 442, 445; (50) 249.
- leaf disease, (42) 49.
- leaf miner, life history and control, (42) 650.
- leaves, transpiration, (48) 236.
- little disease—
 - cause, (48) Del. 642.
 - dissemination, (50) 751.
 - distribution, (45) 547.
 - studies, (41) N.J. 54, Del. 157; (44) N.J. 346, Del. 444; (46) Del. 646; (47) N.J. 249, 844.
- mildew, notes, (45) 48; (46) 741; (50) 249.
- mite, notes, (49) Pa. 251.
- moth, oriental—
 - control, (43) 558; (44) 254.
 - effect of insecticides on larvae, (44) 551.
 - in France, (49) 555.
 - in Japan, (43) 456.
 - life history, (46) Va. 659.
 - notes, (41) 60, 63, Conn.State 158, 164, 459, 757; (42) 545, 649, N.J. 849; (43) 359; (46) 750; (47) 253, 760; (48) N.J. 353.
 - summary, (50) 558.

Peach—Continued.

- Oidium, prevention, (43) 349.
- orchard—
 - devitalized, studies, (47) 342.
 - financial history, (41) Mich. 147.
 - restoration, (47) Md. 235.
 - soil treatment experiments, (49) Ill. 336.
 - survey, (43) Colo. 144.
- parasites, (43) 238; (50) 453.
- ripe rot, notes, (44) 446.
- root borer, control, (44) Oreg. 850; (46) 750; (50) Oreg. 53.
- roots, resistance to freezing, (44) N.Y. Cornell 820.
- rootstock, identification, (49) Calif. 637.
- rosette in New South Wales, (44) 749.
- rosette, studies, (47) Ga. 444; (49) 648.
- rot, notes, (46) 447.
- sawfly in Japan, (42) 159.
- sawfly, studies, (48) 159.
- scab, control, (42) Va. 345; (43) 238, 743; (44) Mich. 144; (45) Miss. 139; (46) 453; (47) Conn. State 140, U.S.D.A. 441; (48) 351; (49) Conn.State 534.
- scale, West Indian, control, (41) 847.
- serpentine leaf miner, life history studies, (42) 650.
- shot-hole, notes, (42) Calif. 843; (43) 243; (44) 49, 642, 842; (50) 453.
- silver-leaf, notes, (49) 845.
- sirup, preparation, (44) N.J. 359.
- sizing machine, (43) U.S.D.A. 836.
- spike disease, studies, (42) 544.
- stocks, longevity, (46) Tex. 335.
- survey in New Jersey, (43) 835.
- thrips, dusting for, (43) 451.
- thrips in California, (46) 853.
- tissue, permeability, (48) Del. 623.
- tree growth, effect of fertilizers, (47) N.H. 437.
- tree protector, injury from, (44) Del. 444.
- trees, composition, effect of shading and ringing, (49) N.H. 741.
- trees, defoliation, (45) Del. 646.
- twig borer, control, (44) Calif. 752.
- twig borer in California, (48) 751.
- twig borer, spraying experiments, (42) 740.
- twig moth—
 - control, Calif. (47) 654; (48) 550.
 - studies, (41) Conn.State 158, N. Mex. 458; (44) 653, Oreg. 850; (49) Calif. 53, Oreg. 254.
- wilt disease, new, (50) 751.
- wood rots, parasitic, (41) 157.
- yellow—
 - cause, (48) Del. 642.
 - dissemination, (50) 751.
 - distribution studies, (45) 547.
 - notes, N.J., (41) 54; (44) 346.

Peach—Continued.

- yellow—continued.
 - studies, (41) Del. 157; (46) Del. 646; (47) N.J. 249, Mich. 441, 844.
- Peach-almond hybrid, (46) 841.
- Peaches—
 - adaptation in relation to hardiness, (41) 144.
 - antiscorbutic value, (47) 62, 568.
 - as affected by freeze, (48) N.J. 339.
 - as affected by sodium nitrate, (48) S.C. 639.
 - blossoming, relation to temperature, (48) Mo. 443.
 - breeding experiments, (44) 533; (49) 436.
 - breeding experiments, N.J. (41) 41; (42) 835; (44) 337; (48) 339.
 - breeding in New Jersey, (50) 543.
 - composition, changes in, (46) Del. 642.
 - cover crops and fertilizer treatments, (46) 444.
 - cover crops for, Del. (41) 145, 444.
 - culture—
 - experiments, (44) 533; (50) Can. 340.
 - experiments in Arizona, (50) U.S.D.A. 138.
 - in Asia, (45) 45.
 - in Florida, (42) 737.
 - in Germany, treatise, (41) 445.
 - in Missouri, (50) Mo. 836.
 - in Ohio, (49) Ohio 340.
 - principles, (43) 438.
 - dried, energy value, (46) 859.
 - drying, (42) Calif. 804; (45) 720, Calif. 808.
 - dusting experiments, (42) Va. 345; (45) Va. 137, Miss. 138; (48) N.J. 354.
 - dusting v. spraying, (43) 238, 743; (45) 253; (49) Conn.State 534.
 - effect of cowpea cover crops, (47) Ill. 830; (48) 139.
 - effect of cultivation, (44) Va. 739.
 - espalier-grown, effect of wall color on ripening date, (49) 39.
 - factors affecting hardiness, (42) 139.
 - fertilizer experiments, (41) N.J. 41, Mo. 649; (42) Ohio 836; (43) Oreg. 145, Pa. 539; (44) Del. 440, Oreg. 837; (47) 339, Pa. 438, Ark. 740; (50) Mass. 642, S.C. 642.
 - foliar glands, significance of, (42) 128.
 - freezing temperature for buds, (44) 740.
 - fruit-growth measurements, (44) N.J. 337.
 - girdling experiments, (48) Calif. 534.
 - growth as affected by fertilizers, (48) 138, 139, 140.
 - harvesting and handling, (47) Calif. 536.
 - Indian cling, value as stock, (47) Tex. 439.

Peaches—Continued.

- inheritance of foliar glands, (48) 138.
- inheritance of morphological characters, (45) 539.
- inheritance of unit characters, (43) 540.
- insects affecting, (44) 548, Mo. 754; (47) 655.
- irrigation experiments, (44) Calif. 738.
- J. H. Hale, fruit setting on, (48) 837.
- Monilia on, (42) 150.
- multiple fruits in, (47) 40; (49) 438.
- nematode resistance in, (50) 140.
- nematode resistance in, transmission, (50) 751.
- new or noteworthy, (49) N.Y.State 338.
- nitrogen in, variation, (45) Del. 638.
- odorous constituents, (46) 202; (48) 608.
- Phony, description, (45) 450.
- pollen germination, studies, (42) 639.
- pollination studies, (45) 836; (47) Calif. 639.
- post-harvest dusting experiments, (50) U.S.D.A. 662.
- preparation for market, (47) U.S.D.A. 239.
- preserving, (45) 665.
- propagation, (46) N.J. 536.
- pruning experiments, (41) N.J. 41, 239; (42) Calif. 139, 440, N.J. 835; (44) Calif. 738; (45) 439; (47) 339, 342; (48) 444, Mich. 536; (49) N.Y.Cornell 638.
- ringing experiments, (42) 639; (44) 43.
- soil treatment for, (44) Ill. 836.
- spacing experiments, (47) Calif. 638.
- spray residue on, (47) U.S.D.A. 360.
- spray schedule for, (42) Ark. 736, Wash. 836; (43) N.J. 37; (44) Mo. 535; (47) N.J. 140, Ohio 140; (49) N.J. 138.
- spraying and dusting experiments, (44) Mich. 144; (47) Conn.State 140, U.S.D.A. 440; (49) N.Y.State 49.
- spraying directions, (43) Ga. 146.
- spraying experiments, (41) 657; (42) Calif. 843; (43) 238, Pa. 539; (44) 551; (45) Miss. 138; (49) Calif. 53, N.J. 349.
- spreader tests on, (49) 353.
- stocks for, (42) Calif. 833; (44) 145; (45) 741; (47) 238.
- storage experiments, (47) Calif. 639.
- storage temperature, effects, (47) 151.
- sulphuring tests, (47) 339.
- sulphuring, value of, (42) 639.
- thinning, (43) Ohio 341; (47) Mich. 697; (49) Calif. 235; (50) Can. 340.
- thrips affecting, (41) Mich. 660.
- time for transplanting, (43) Mo. 142.
- time of fruit bud differentiation, (49) 834.
- transpiration studies, (47) Calif. 628.

Peaches—Continued.

- varieties—
 - at San Antonio, (47) U.S.D.A. 438.
 - characteristics, (44) Ohio 741.
 - for canning, (44) 534.
 - for Delaware, (44) Del. 440.
 - for Michigan, (47) Mich. 140.
 - nursery identification, (50) 643.
- variety tests, (41) Del. 145; (43) U.S.D.A. 144; (44) 533; (46) S.C. 733.
- winter injured, pruning, (41) Ill. 147.
- winter injury, (41) 749; (44) Conn. State 150; (46) 447; (48) Mo. 455.
- winter injury in 1917-18, (42) Mass. 343.
- Peacock-hen hybrids, (46) 575.
- Peafowl hybrids, studies, (44) 668.
- Peanut—
 - Association, Southeastern, regulations, (46) 834.
 - bacterial wilt, studies, (49) 246.
 - bran, analyses, (42) Mich. 63.
 - bunching disease, notes, (42) 350, 542.
 - butter, analysis, (50) 610.
 - butter, manufacture, (44) U.S.D.A. 117.
 - by-products, composition, (41) 564.
 - cake—
 - analyses, (42) Tex. 769, 770.
 - composition and use, (44) 363.
 - cracked, analyses, (46) Tex. 675.
 - energy value, (47) 69.
 - feeding value, (50) 367.
 - sugar in, (43) 671.
 - diseases, notes, (41) 745; (45) 48.
 - fat, digestibility, (47) U.S.D.A. 560.
 - feed, analyses, (41) Ind. 564, N.Y. State 868; (42) N.H. 769, Tex. 769; (43) Vt. 464; (45) Tex. 68, N.Y. State 469, 872, Vt. 872; (46) 871; (47) 668.
 - feed as corn supplement, (42) Kans. 375.
 - feed for dairy cows, (41) Tex. 78.
 - feed, unhulled, analyses, (41) N.H. 68; (43) Ind. 69, Ind. 867.
 - feeding, effect on hogs, (44) Ala.Col. 773.
 - flour, nutritive value as wheat supplement, (43) 763.
 - flour, supplementary protein value, (49) 361.
 - gummosis, studies, (50) 347.
 - hay, feeding value, (42) Tex. 369.
 - hay with nuts, analyses, (46) Tex. 675.
 - hulls, acetone and alcohol from, (48) 713.
 - hulls, analyses, (44) Mich. 568.
 - hulls, digestibility and productive value, (47) Tex. 472.
 - hulls, feeding value, (42) Tex. 369.
 - hulls, ground, analyses, (42) Tex. 769.
 - kernels, analyses, (48) Can. 368.
 - leaf spot, (46) 648.

Peanut—Continued.

meal—

- analyses, (41) Conn.State 176.
Can. 565, Ind. 868; (42) Tex.
769, Mass. 866; (43) N.J. 69.
Ind. 867; (44) 267; (45) Tex.
68, N.Y.State 469, N.J. 775;
(46) Tex. 675; (47) N.J. 571.
- and hulls, analyses, (41) N.H. 68.
composition and retail prices,
Conn.State (44) 176; (45) 375.
definition, (48) U.S.D.A. 14.
- digestibility, (48) 574; (50)
Mass. 168.
- feeding value, (41) Fla. 568; (42)
Tex. 369; (47) Ga. 480, Ark.
776, 782.
- fertilizing value, Ala.Col. (43)
135; (45) 119.
- nitrogen availability, (43) Ala.Col.
135.
- protein, nutritive value, (49) 865.
v. corn meal for milk production,
(50) Can. 375.
- oil, analyses, (45) 719; (46) 109; (49)
611.
- oil, arachidic and lignoceric acids in,
(48) 712.
- oil cake, definition, (48) U.S.D.A. 14.
- oil, digestibility, (45) 62.
- oil feed, analyses, (44) Mass. 671,
N.H. 671.
- oil feed, unhulled, definition, (48)
U.S.D.A. 14.
- oil, hardened, arsenic and nickel con-
tent, (42) 610.
- oil, hydrogenated, food ^A value, (45)
367.
- oil, hydrogenation, (41) 805.
- oil, losses in refining, (49) 311.
- oil, production, (46) 636.
- oil, sampling and examination, (43)
805.
- pasture for hogs, (41) Ala.Col. 369;
(50) Tex. 71.
- pork problem, (47) 278.
- press cake sauce, manufacture, (49)
U.S.D.A. 312.
- products, analyses, (48) U.S.D.A. 13.
- products, feeding value, (41) 564; (44)
Tex. 868.
- rations, effect on pork, (47) N.C. 575.
- rust in Trinidad, (44) 747.
- rust, notes, (43) 346.
- shells, digestibility, (50) Mass. 168.
- skins, analyses, (48) Can. 368.
- thrips, notes, (47) Fla. 656.
- tikka disease, (42) 145; (44) 445;
(48) 44; (50) 146.
- warehouses, regulations, (50) U.S.D.A.
594.

Peanuts—

- analyses, (42) Tex. 769.
- and peanut meal, feeding value, (49)
Ga. 578.
- as feed for hogs, (42) Okla. 267.

Peanuts—Continued.

- breeding experiments, (43) 637; (45)
Okla. 431; (46) S.C. 725; (48) S.C.
629; (49) 735, Fla. 824; (50) S.C.
637.
- cost of production, (46) 590.
- crushing, by-products from, (48) U.S.
D.A. 13.
- culture, (47) Miss. 827; (50) 637.
culture—
and expression of oil, (43) 240.
and use in Uruguay, (45) 35.
- experiments, (41) Tex. 35; (42)
436; (43) Tex. 34; (44) 137,
733; (45) Kans. 33, 35, Okla.
430; (47) Okla. 824; (48) Va.
333; (49) Tex. 429.
- improvement, (48) 833.
- in Argentina, (47) 229.
- in Arizona, (41) Ariz. 332.
- in Burma, (41) 529; (42) 436.
- in West Indies, (41) 528, 825.
- trade and uses, (44) 735, 827.
- detection in feeds, (50) 468.
- effect on pork, (42) Tex. 169; (49) Fla.
873.
- effect on quality of lard, (42) Ala.Col.
870.
- energy content, (42) 660.
- feeding value, (50) Miss. 68.
- fertilizer experiments, (42) 436; (43)
N.C. 424; (44) 733; (45) 35
- from Philippines, survey, (44) 640.
- improvement by selection, (46) 830.
- in water culture, equilibrium concen-
tration, (41) 132.
- insects affecting, (42) 358; (45) 853;
(47) 551.
- nitrogen distribution of proteins, (45)
717.
- notes, (46) Guam 726.
- position in pod and productiveness,
(41) N.J. 38.
- production, (44) U.S.D.A. 37.
production—
in Cuba, (42) 31.
- in French Africa, (42) 230.
- in French colonial possessions,
(42) 32.
- in West Indies, (45) 33.
- project study outlines, (44) 596.
- returns from, in Georgia, (49) 90.
- rotation experiments, (45) 35; (48)
Va. 333.
- seed weight and abortiveness, (41) N.J.
38.
- selection experiments, (41) 636.
- statistics, (42) U.S.D.A. 731.
- steam-cooked, digestibility, (43) 564.
- stored, moth affecting, (42) 453.
- varieties, behavior, (48) Guam 228.
- variety tests, (41) Tex. 35; (42) 436;
(43) Okla. 32, 637; (44) 527, 733,
827; (45) 35, 340; (46) 436; (47)
Okla. 824; (48) 629; (49) Guam
427, Tex. 429; (50) U.S.D.A. 132,
828.

Peanuts—Continued.

- vitamin A in, (44) 765.
- whole pressed, analyses, (45) Tex. 68.
- yield as affected by methods of propagation, (49) Guam. 427.

Pear—

- bitter pit, control, (48) 456.
- black spot, control, (45) 652; (48) 50; (49) 546.
- black spot, winter spore form, (47) 649.
- blight, (46) Mont. 651.
- blight—
 - American, in New Zealand, (45) 849.
 - breeding for resistance, (41) S.Dak. 238.
 - cankers, control, (48) Calif. 542.
 - control, (42) 544; (43) 550; (48) 350.
 - disinfectants for, (41) 452, 658.
 - dissemination, (41) Ill. 147.
 - history, (45) 849; (48) 350.
 - resistance, studies, (44) Iowa 440, Oreg. 837; (49) Oreg. 546.
 - resistant stock, (44) 450; (49) Ky. 531; (50) 37.
- blooms, thinning, (46) 140.
- blossom bacillus, studies, (41) 841.
- borer in Japan, (43) 456.
- borer, studies, U.S.D.A. (44) 162, 163.
- bread, digestibility and food value, (43) 64.
- brown bark spot, (47) Mont. 843.
- brown heart, cause, (50) 449.
- bud midge in New Zealand, notes, (42) 249.
- by-products, utilization, (49) Calif. 206.
- candy, preparation, (49) Calif. 206.
- canker, control, (44) 848.
- canker, European, in Oregon, (49) Oreg. 539; (50) 148.
- cephus, notes, (44) 167.
- chlorosis, control, (48) Calif. 542; (49) 755.
- core rot, (47) 545.
- die-back, notes, (44) 49.
- disease, new to America, (42) 450.
- diseases, (42) 150, 541; (43) Ill. 847; (44) Calif. 744.
- diseases and pests, control, (41) U.S.D.A. 836; (45) Wash. 44.
- diseases, parasitic. during 1915-1920. (49) 445.
- diseases, physiological, (44) Oreg. 840.
- European canker, (47) 843.
- fire blight, notes, (43) 656; (49) 44, 442.
- fire blight, resistant variety, (49) Ga. 537.
- foliage, injury from sprays, (47) Mass. 646.
- fruit worms, control, (44) Oreg. 851.
- industry in United States, (42) U.S.D.A. 639.

Pear—Continued.

- leaf curling midge, (46) 460.
- leaf rollers, control, (44) Oreg. 851.
- leaf spot, control, (48) N.J. 351.
- leaf suckers, summary, (45) 860.
- leaves, transpiration, (48) 236.
- mildew epidemic of 1921, (49) 445.
- orchard survey, (43) Colo. 144.
- phytophthora rot, (44) 648.
- pollen, viability and potency, (46) 39.
- powdery mildew, notes, (41) 657.
- powdery mildew, outbreak, (50) 750.
- psylla—
 - control, (42) N.J. 849; (46) N.J. 555, N.Y.State 796; (47) Mich. 454; (48) Mich. 251; (49) N.Y. State 52.
 - in Ontario, (42) 52.
 - notes, (41) N.J. 58; (45) 454; (48) N.J. 353; (49) 152.
 - spraying experiments, (44) N.J. 349.
- root aphid, control, (47) 360.
- roots, resistance to freezing, (44) N.Y. Cornell 820.
- rosette, studies, (49) Wash.Col. 755.
- rust, immunity of a pear variety to, (43) 753.
- rust in Oregon, (41) 152.
- rust, notes, (42) 50.
- sawfly in Japan, (42) 159.
- scab, control, (45) 146; (47) 242, Mich. 440; (48) 744.
- scab, notes, (43) 246; (44) 48, 53, 346.
- scale, Italian, control, Calif. (44) 654, 752.
- shoot growth rate, nature of, (46) 127.
- sirup, preparation, (49) Calif. 206.
- slug, notes, (45) Conn.State 149; (47) 848.
- slug sawfly, parthenogenesis, (43) 60.
- spread, manufacture, (46) 755; (49) Calif. 206.
- spur blight, notes, (48) 147.
- thrips, control, (45) N.Y.State 659; (47) Calif. 653; (48) Calif. 551.
- thrips, notes, (44) Oreg. 850, 853.
- thrips, summary, (44) Calif. 654.
- tree borer, sinuate, in New Jersey, (41) 549.
- tree borer, sinuate, notes, (45) Conn. State 149.
- tree disease, notes, (48) Calif. 541.
- trees—
 - chlorotic, restoring, (49) 755.
 - growth and correlation in branches, (45) 836.
 - growth inhibiting substance in, (44) 133.
 - growth studies, (47) Calif. 639.
 - mistletoe on, (45) 751.
 - starch storage in, (50) 835.
- twig blight, control, (43) 753.
- vinegar, preparation, (49) Calif. 206.

Pears—

abscission phenomena, (43) 539.
 aleurodid enemy of, (50) 556.
 arsenical spray residue on, (47) 361.
 as affected by chloropicrin, (45) 28.
 as affected by freeze, (48) N.J. 339.
 Bartlett, pollination, (41) Calif. 240;
 (45) 139.
 Bartlett, ripening and storage, (44) 42.
 blooming dates, (42) N.J. 835; (43)
 U.S.D.A. 437.
 breeding experiments, (41) S.Dak. 238;
 (43) Md. 143; (44) 145; (45) 640;
 (46) 39; (47) Iowa 741.
 calyx spray, formula, (49) Conn.State
 742.
 canned and dried, analyses, (47) Calif.
 660.
 cigar leaf roller on, (44) 760.
 commercial districts and varieties,
 (42) U.S.D.A. 639.
 composition, effect of tree chlorosis,
 (50) 248.
 cull, uses, Calif. (47) 614; (49) 206.
 culture, (44) Del. 440.
 culture experiments, (47) Alaska 534;
 (48) U.S.D.A. 235; (49) Oreg. 533;
 (50) U.S.D.A. 138.
 culture in Asia, (45) 45.
 depth of planting studies, (44) Oreg.
 835.
 dried, antiscorbutic value, (47) 62.
 dried, energy value, (46) 859.
 drying, (41) 557; (42) Calif. 804;
 (45) Calif. 808.
 dusting and spraying experiments,
 (47) Mich. 439.
 effects of handling on cold storage,
 (43) 39.
 evaporation, (45) 720.
 fertilizer experiments, (43) Oreg. 145;
 (44) N.Y.State 534, Oreg. 837; (50)
 Mass. 642.
 flower bud formation date, (48) 443.
 frost resistant varieties, (45) 346.
 girdling experiments, (48) Calif. 534.
 grafting old trees, (42) 534.
 graphic records for, (42) 534.
 growth studies, (48) Calif. 534.
 handling, shipping, and cold storage,
 (47) U.S.D.A. 537.
 harvesting and handling for shipment,
 (47) Calif. 537.
 harvesting and storage, (42) Oreg. 40.
 in New York, (49) N.Y.State 340.
 insects affecting, (44) Mo. 754; (50)
 N.Y.State 555.
 insects affecting, handbook, (44) Oreg.
 160.
 keeping qualities, (43) 238; (47) 341,
 Calif. 639.
 maturity, apparatus for testing, (46)
 Oreg. 641.
 maturity, pressure test for, (42) Oreg.
 40.
 Monilia on, (42) 150.

Pears—Continued.

new or noteworthy, (49) N.Y.State
 338.
 notching experiments, (43) 743.
 of New York, monograph, (48) N.Y.
 State 537.
 origin of, (43) 438.
 parthenocarp in, (48) 827.
 Pineapple, botany and history, (50)
 Ga. 543.
 Pineapple, notes, (49) Ga. 531.
 pollination, (42) Calif. 832; (48)
 Calif. 535; (49) Oreg. 534.
 preserving, (45) 665.
 pruning, (42) Calif. 139; (44) Calif.
 738; (48) Mich. 536.
 pruning and fertilizing, (50) 441.
 pruning, Caldwell method, (46) 736.
 pruning, Lorette method, (45) 346.
 quince stocks for, (44) 42.
 relation of pruning to fruit bearing,
 (49) N.Y.Cornell 638.
 ringing experiments, (43) 742.
 ripening temperature, optimum. (42)
 Calif. 832.
 scar damage by insects, (45) 658.
 self-sterility tests, (42) 138.
 spacing experiments, (47) Calif. 638.
 spray residue on, (47) U.S.D.A. 360.
 spray schedule for, (42) Ark. 736,
 Wash. 836; (43) 37; (45) Wash.
 44; (47) N.J. 140, Ohio 140; (49)
 N.J. 138.
 spraying experiments, (43) N.Mex.
 358; (45) 457; (46) 646; (48) N.J.
 351; (49) 153, N.Mex. 154, Oreg.
 546.
 starch stored in, (50) 299.
 stem length in, (42) 536.
 stock and scion studies, (46) 841.
 stocks for, (42) 536, 737, Calif. 833,
 S.Dak. 836; (44) 145; (47) 238.
 stocks for, value of different roots, (43)
 745.
 storage, (44) Oreg. 833; (45) 346;
 (48) Calif. 535, 538; (49) 437.
 stored, antiseptic treatment, (47) 833.
 time of fruit bud differentiation, (49)
 834.
 time of picking studies, (49) Oreg.
 533.
 transpiration studies, (47) Calif. 628.
 use in bread making, (43) 64.
 varieties—
 classification, (47) 342.
 for Michigan, (47) Mich. 140.
 hardy, (42) S.Dak. 836.
 in Great Britain, (45) 135.
 variety, new, in Sweden, (44) 443.
 vitamin B in, (43) 765.
 winter injury, (44) Conn.State 150;
 (46) 139.
 winter study, (46) 839.
 witches' broom on, (42) 49.

Peas—

- abnormality in heredity of embryo color, (50) 331.
- absorption of calcium chlorid ions, (48) 726.
- acreage and planting time, (44) P.R. 433.
- action of copper on, (45) 29.
- aerial fertilization with carbon dioxid, (41) Vt. 833.
- Alaska, results of selection, (47) 339.
- analyses, (43) 63; (50) Oreg. 7.
- and barley for fattening pigs, (45) Idaho 271.
- and oats—
 - as silage, (41) Mo. 334.
 - as silage and soiling crop, (49) Oreg. 526.
 - as spring forage, (41) Mo. 637.
 - culture experiments, (49) Mont. 430.
 - seeding experiments, (49) Mont. 430.
 - yields, (41) N.J. 35.
- and pea products, analyses, (41) Can. 565.
- anthocyanin formation in blooms, (46) 433.
- as affected by—
 - carbon dioxid, (44) 725.
 - potash, (49) 817.
 - salt, Calif. (48) 515, 524.
 - sodium arsenite, (41) 625.
 - sulphur, (46) Wash. 427; (50) Oreg. 724.
- as dry-farm crop, (43) Ariz. 733.
- as forage crop, Hawaii (44) 29, 30.
- as hay crop, (48) N.Dak. 226.
- as nurse crop, (45) Wash. 216; (47) Wash.Col. 529.
- as orchard cover crop, Mont. (49) 136, 833.
- as source of protein for egg production, (47) Idaho 870.
- Ascochyta on, (46) 241.
- Bacillus botulinus on, (44) 763.
- Bacterium solanacearum on, (42) 352.
- barium in, (46) Colo. 29.
- black eye in, studies, (46) 125.
- breeding experiments, (42) Minn. 834; (44) Minn. 739; (49) 329, Idaho 732.
- canned—
 - bacterial flora, (46) 859.
 - effect of lemon juice on, (42) Calif. 863.
 - flat sours of, (50) Mich. 459.
 - heat resistant organisms in, (43) Mich. 114.
 - standards for, (46) 15.
- canner, cost of production, (48) N.Y. Cornell 787.
- canner, germination studies, (44) 233.
- canning, (47) 262.
- canning—
 - cost of, (45) Wis. 191.

Peas—Continued.

- canning—continued.
 - effect of inoculation, (47) Wis. 430.
 - inoculation tests, (46) 19.
 - studies, (46) U.S.D.A. 664.
 - temperature changes in, (45) U.S.D.A. 560.
- Colletotrichum pisi on, (50) 652.
- cost of production, (46) Miss. 590.
- culture, (44) Alaska 532, 827; (45) 630; (47) Alaska 535; (48) Minn. 338.
- culture—
 - directions, (49) Oreg. 133.
 - experiments, (43) 829; (44) Mont. 331, Utah 525; (48) Can. 450; (49) Alaska 426, Alaska 435; (50) Can. 231, Alaska 532.
 - for canning, (45) Mich. 432, Wis. 439.
 - in British Columbia, (42) 733.
 - in the Sudan, (45) 538.
 - in West Indies, (41) 528, 825.
 - on peat soil, (43) 23.
 - on reclaimed peat swamps, (43) Oreg. 22.
- digestibility coefficients, (48) 574.
- dusting experiment, (45) 344, 552.
- effect of preceding crop, (45) Can. 824.
- effect on following crop, (44) R.I. 33; (45) 738; (46) 336.
- effect on oxidation in soil, (47) 213.
- effect on soil acidity, (47) 723.
- energy value, (47) 69.
- enzym content, (42) 228.
- failure in Delaware, (44) 153.
- feeding value, (48) 67; (49) Idaho 774.
- fertilizer experiments, (41) N.Dak. 823; (42) 222, 223; (44) 421, Alaska 513; (47) S.C. 24, Wash. 124.
- field—
 - and Sudan grass, comparative yields, (41) Nev. 227.
 - as affected by alkali salts, (41) 623.
 - as affected by iron compounds, (41) 430.
 - as emergency hay crop, (49) Wis. 629.
 - as green manure, (43) 134.
 - as hay and forage, (43) 527.
 - as hay crop, Alaska, (44) 328, 329.
 - cultural directions, (45) N.Dak. 225.
- culture, (44) U.S.D.A. 231, Mont. 331, Alaska 522.
- culture experiments, (41) Alaska 31, 333, Can. 528, N.Dak. 824; (44) Alaska 329, N.Dak. 524; (45) Kans. 33, Guam 34, Idaho 222.

Peas—Continued.

field—continued.

- culture in Idaho, (41) Idaho 37.
- for fattening lambs, (45) 69.
- hogging down, (41) U.S.D.A. 72;
- (45) Idaho 271; (46) 171; (48) N.Dak. 72.
- inoculation, (41) Alaska 30, Idaho 38; (45) Wis. 228.
- production and utilization, (45) Wis. 131.
- rotation experiments, (44) Oreg. 827.
- rotation with wheat, Idaho, (41) 38, 226.
- seed production maps, (41) U.S.D.A. 236.
- seeding rate, (44) Wash. 225.
- use of soil potassium by, (43) 218.
- varieties, (49) Mont. 430.
- variety tests, (41) Alaska 30, Alaska 31, Idaho 38, Idaho 225, Idaho 226, Ariz. 331; (43) 528, Ariz. 733, Wash. 737, Minn. 823; (44) Alaska 330, Oreg. 827.
- yields, (44) Wash. 225.
- for hay, variety tests, (49) Can. 734.
- foreign fodder, composition and digestibility, (48) 766.
- frost injury, (41) 335.
- garden. strain for Alaska, (41) Alaska 31.
- genetics of rogues among, (47) 29.
- green manuring experiments, (48) N.Dak. 226.
- green, net weight in pods, (49) Can. 832.
- growth in artificial light, (48) 26.
- hard after cooking, cause, (47) 262.
- hay and grain yields, (47) U.S.D.A. 430.
- heredity of rogue types, (46) 37.
- hybridization experiments, (46) 430.
- in silage crop mixtures, (41) 676, 732.
- inheritance of flower color, (47) 822.
- inheritance of rogue type in, (49) 741.
- inoculation, (41) 523; (45) Colo. 213; (48) Wash.Col. 832, 836.
- insect control in, (47) Ohio 358.
- lithium in, (46) Colo. 29.
- Mendelian characters, (44) 428.
- natural inoculation, (45) Colo. 213.
- nematode injury, (41) 51.
- notes, (46) Guam 726; (47) Alaska 527.
- phytin content, (47) 366.
- pigeon, *see* Pigeon peas.
- Pods and seeds in relation to section of plant, (41) N.J. 43.
- production, effect of enzym activity, (45) Del. 626.
- production for canning, (47) U.S.D.A. 139.
- production in West Indies, (45) 33.
- proteins, deficiency of, (45) 864.

Peas—Continued.

- rotation experiments, (41) N.Dak. 139, R.I. 434, N.Dak. 823; (44) Utah 525; (49) Oreg. 526.
- seed production, (47) U.S.D.A. 139; (48) N.Dak. 225.
- seeding experiments, (43) Wash. 738, 829; (45) Mo. 224; (49) Idaho 732.
- selected strains, (50) Minn. 138.
- Sitones lineatus on, (45) 363.
- staking, (43) 339.
- Tangier, seeding experiments, (49) Oreg. 525.
- time of planting tests, (50) Can. 440.
- toxic point of alkali salts for, (41) 320.
- v. barley for pigs, (50) Can. 776.
- variability in, (45) 345.
- varieties, (49) Wis. 629.
- varieties—
 - behavior, (48) Guam 228.
 - for Alaska, (44) Alaska 522.
 - for Canada, (47) 823.
 - from Finland, seed fundaments, (42) 630.
- variety tests, (41) 237, 825; (42) Wis. 338, Wash. 631, Minn. 824, Minn. 825, Minn. 835; (43) Tex. 36, 231, U.S.D.A. 330, Can. 735, 829; (44) R.I. 31, Wis. 226, Utah 525; (45) N.Dak. 235, Can. 822; (46) 131, Mont. 327, 839; (47) Mich. 129, 824; (48) N.Dak. 224, U.S.D.A. 224, Can. 227, 629, 730; (49) Wash.Col. 224, Idaho 732; Can. 734; (50) U.S.D.A. 132.
- vascular apparatus in, (47) 127.
- viability, effect of loss of water, (48) N.J. 353.
- vitamin A in, (46) 357.
- vitamin A in, relation to pigments, (46) 257.
- water requirements, (50) 828.
- yields, (43) 829; (47) Wash.Col. 528.
- zinc in, (41) 464.
- Peasant class, rise, in Europe, treatise, (49) 191.
- Peasants in Denmark, improvements in position, (48) 392.
- Peat—*see also* Moor soils.
 - absorptive power for liquid manure and ammonia, (41) 722.
 - ammonia absorbing power, studies, (42) 526.
 - and peat-forming plants, H-ion concentration, (41) 19.
 - as bacteria carrier, (47) 319.
 - as organic matter for soil, (47) R.I. 725.
 - bacterization, (42) 520.
 - bacterized, effect on plant growth, (43) 514.
 - bog, drained, soil shrinkage in, (46) Wis. 186.
 - bog, pump drainage of, (46) Wis. 185.
 - bogs, effects of liming, (43) 325.

Peat—Continued.

- bogs, fertilizer experiments, (43) 23.
- bogs in Ontario, (48) 424.
- bogs, sand covering for, (43) 23.
- composts, studies, (45) Mich. 213; (48) U.S.D.A. 621.
- decomposition, determining degree, (48) 815.
- decomposition experiment, results, (48) Mich. 216.
- dehydration, (48) 815.
- deposits, evidence of climatic changes, (46) 317.
- deposits in Madagascar, (48) 814.
- deposits in Minnesota, (41) 517.
- deposits in United States, (44) 623.
- dust, use in latrines and privies, (49) 818.
- effect on cement and concrete, (47) 687.
- effect on transpiration and growth of plants, (47) 523.
- excrement mixture, fertilizing value, (49) 818.
- exhibit in Philadelphia, (46) 219.
- fertilizer experiments, (46) 216.
- fertilizing value, (41) 722; (43) Minn. 815; (44) R.I. 22; (46) R.I. 213; (47) Minn. 320, R.I. 419.
- fields, experimental, results, (45) Minn. 215.
- formation of soluble substances in, (45) Mich. 620.
- heat value, relation to decomposition, (44) 720.
- in the Dismal Swamp, studies, (42) 16.
- industrial utilization, (43) 129; (48) 814.
- industry in America, (41) 131.
- investigations, value to cranberry industry, (50) 321.
- lands, first breaking, (49) 686; (50) 388.
- litter—
 - and mull, manufacture, (47) 26; (49) 818.
 - as affected by moisture in air, (43) 323.
 - for conservation of liquid manure, (43) 423.
 - nitrogenous, fertilizing value, (46) 319.
 - use in stables, (49) 818.
- marshes, tiling, (46) 381.
- molasses, energy value, (47) 69.
- moors, origin of strips on, (45) 514.
- moors, utilization, (47) 118.
- moss, digestibility, (45) 674.
- moss litter, absorbent for water, (42) 19.
- mull as fertilizer filler, (49) 818.
- nitrogen, acid amid fraction of, (46) 21.
- nitrogen availability in, (42) Calif. 812.

Peat—Continued.

- nitrogen recovery from, (43) 219.
- of Italy, analyses, (50) 419.
- passive biological nature, (50) 720.
- pots for plant propagation, (44) 40.
- preparation and use in Ireland, (46) 584.
- production and sale, (42) 19.
- production and use in 1918, (42) 428.
- production in United States, (44) 130, 215; (50) 727.
- quality and value, (42) U.S.D.A. 328.
- resources of Ireland, (44) 124.
- resources of United States, (45) 816; (49) 124.
- saturated with naphthalin as smudge, (44) 811.
- situation in Canada, (48) 424.
- soil, draining experiments, (45) Wis. 289.
- soil, effect of phosphorite rock, (45) 816.
- soil, phosphate-deficient, fertilizer requirements, (44) 624.
- soils—
 - agricultural value, Minn. (43) 420, 814.
 - chemical composition, (43) 22.
 - chemical requirements, (44) 623.
 - colloidal chemistry of, (48) 814.
 - decomposition, determination of degree, (43) 213.
 - effect on concrete tile, (49) 790.
 - fertilizer experiments, (43) N.C. 424.
 - glacial drift as liming material for, (43) 631.
 - grass mixtures for, (42) 733.
 - improvement, (45) 422; (46) 216.
 - in Wisconsin, development, (44) 623.
 - iron sulphid oxidation in, (44) 625.
 - lime requirements, (49) N.C. 724.
 - liming experiments, (42) 431.
 - management, (41) 624; (42) Minn. 813; (47) 620; (50) Minn. 120.
 - of France, industrial use, (47) 19.
 - of Indiana, value, (44) 623.
 - of Ohio, (41) Ohio 212.
 - reclamation, (47) 620; (48) 617.
 - sulphids in, (48) 423.
 - treatment, (50) 321.
- source of energy for Azotobacter, (44) 814.
- sphagnum-covered, nitrogen distribution, (43) 19.
- studies, (43) 725.
- summary, (45) 724.
- swamps, reclamation, (43) Oreg. 21.
- treated, fertilizing value, (41) Can. 516; (43) 23.
- treatise, (41) 518, 814.
- use as fertilizer, (44) 625.
- use for soil improvement, (43) 22.

Peat—Continued.

- use on unlimed soils, (42) Minn. 826.
- v. straw as litter, (44) 625.

Pebrine, eliminating, (45) 657.

Pebrine in India, (45) 554.

Pecan—

- case bearer, spraying experiments, (45) 256.
- diseases, control, (44) U.S.D.A. 347.
- kernel spot, studies, (48) U.S.D.A. 50; (50) 556.
- rosette in relation to soil deficiencies, (43) 48.
- rosette, studies, (46) 653; (47) U.S.D.A. 154, 846.
- scab, control, Miss. (47) 250; (49) 441.
- wood rot, (43) 48.

Pecans—

- analyses, (44) 503; (45) Tex. 161.
- breeding, technique, (45) 140.
- budding and grafting, (43) 746; (47) N.C. 535.
- culture experiments, (43) Md. 143; (47) Okla. 830; (48) U.S.D.A. 235; (49) N.Mex. 532; (50) U.S.D.A. 138.
- culture in Florida, (46) 41.
- culture in Texas, (48) 738.
- fertilizer experiments, (45) 743.
- grades and standards, (43) 41.
- grafting and top-working, (42) 737.
- history in America, notes, (42) 538.
- imported, in South Africa, (50) 837.
- interplanting fruit crops, (42) 538.
- nitrogen distribution of proteins, (45) 717.
- nutritive value of proteins, (44) 461; (47) 60.
- patch-budding, method, (43) Tex. 240.
- precautions in top-working, (44) 238.
- preparing for market, (43) 441.
- proteins of, analysis, (45) 614.
- self-sterility studies, (45) Ariz. 438.
- spraying, (45) 743; (47) Miss. 250.
- time for transplanting, (43) Mo. 142.
- variations in, (49) 140.
- varieties, (41) 837.

varieties—

- classification, (43) 41, 441.
- for northern planting, (42) 538.
- of Texas origin, (44) 238.
- yields, (47) Ga. 441.

variety tests, (47) N.C. 535.

vitamin in, water-soluble, (44) 461.

winterkilling, (42) Minn. 834.

Pechay, culture directions, (45) 35.

Pectase—

- action, optimum acidity, (45) 204.
- effect on action of pectin, (46) 110.

Pectin—

- and pectic acid, relation in fruits, (49) 48.
- and protopectin, (50) 310.
- behavior toward alkalis and pectase, (46) 110.
- concentration, relation to jelling point (47) 857.

Pectin—Continued.

- estimation as calcium pectate, (47) 610.
- extract from apples, clarification, (47) 206.
- extracting, household methods for, (49) U.S.D.A. 114.
- extracts, jellying power, relation to alcohol precipitate, (50) 508.
- in fruit juice, determination, (49) Hawaii 411.
- in jams and jellies, use, (47) 262.
- in jelly, (43) 616.
- in plants, (44) 110.
- relations of *Sclerotinia cinerea*, (44) 825.
- studies, (46) 207.

Pectinase—

- in pollen, (48) 728.
- produced by *Rhizopus* spp., (46) 325.
- production, effect of substrate and pH value, (49) 729.
- secretion by *Rhizopus tritici*, (45) 749.

Pectinophora—

- and *Platyedra*, synonymy, (41) 258.
- gossypiella, *see* Cotton bollworm, pink.
- Pediculoides ventricosus*, notes, (43) 252; (44) S.Dak. 652, 658; (47) S.Dak. 451; (48) 58.

Pediculopsis graminum, notes, (49) 455.

Pediculus, *see* Lice.

Pedigrees, analysis, (46) 268.

Pegomyia—

- brassicae, *see* Cabbage maggot.
- cepetorum, *see* Onion maggot.
- fusciceps, *see* Seedcorn maggot.
- hyoscyami, control, (49) 156.

Pejibaye of tropical America, (45) 743.

Pelecinus polyturator, parasite of white grubs, (42) 549.

Pelenomus sulcicollis, notes, (41) 758.

Pellagra—

- among Armenian refugees, (45) 265.
- among Turkish prisoners of war, (42) 463.
- among war prisoners in Egypt, (43) 863, 864.
- and acrodynia, (46) 261.
- and bad maize, (42) 761.
- and beriberi, leucocyte changes in, (45) 66.
- and protein, discussion, (50) 164.
- census, in Florence, (44) 172.
- etiology, (44) 262, 465; (47) 65; (48) 865; (49) 263.
- like syndrome in dogs and black-tongue, (47) 285.
- monograph, (42) 761.
- occurrence with ample diet, (45) 668.
- pathology and origin, (42) 462.
- prevention by diet, (50) 669.
- recent work on, (47) 482.
- relation to diet, (47) 269.
- relation to excess of acid, (41) 364.
- relation to maize consumption, (42) 457.

Pellagra—Continued.

studies, (41) 469, 470, 562, 765; (43) 263, 264, 461, 667, 863; (44) 466, 862; (45) 65, 668, 768, 869; (46) 64, 762.

treatment and prevention, (47) 269.
types and treatment, (43) 862.

Pellicularia koleroga, notes, (43) 152; (46) 467.

Peloria, nature and heredity of, (45) 32.

Pemphres affinis, notes, (43) 450; (50) 57.

Pemphigus betae, *see* Beet aphid and Sugar beet root louse.

Pemphigus populi-transversus, notes, (44) 654.

Penguin guano from Falkland Islands, analyses, (48) 425.

Penicillium—

chrysogenum, respiration, effect of pH value, (46) 127.

crustaceum, description, (42) 162.

crustaceum in cold storage meat, (48) 258.

cyclopium, spore germination, (44) 28.

digitatum inoculation, effect on temperature of plant tissue, (48) 432.

divaricatum, penetration into hardwood, (50) 656.

expansum, development, (45) 463.

expansum, notes, (42) 336, 608, 803, 804; (47) 152, 843; (49) 49.

glaucum—

food requirements, (45) 465.

formation of fruiting bodies, (43) 226.

gold absorption by, (41) 329.

notes, (43) 155; (45) 842.

on cold storage meat, (47) 560.

parasitic action, mechanism, (50) 244.

practical cultivation, (41) 80.

resistance to sunlight, (47) 784.

sources of sulphur for, (49) 26.

in creamery butter, (44) 874.

in sugar solutions, studies, (46) 417.

italicum, notes, (47) 242.

olivaceum, description, (42) 162.

oxalicum, inoculation on potatoes, (42) 246.

roqueforti, use in cheese making, (42) 876.

sp., life history, (48) 744.

sp., notes, (41) 450; (47) 839.

sp., utilization of glucose as source of carbon, (45) 354.

spiculisporum n.sp., description, (45) 541.

spiculisporum, notes, (45) N.C. 443.

spores, effect of sodium selenate, (45) 477.

spp., biochemical studies, (44) 575.

spp., distinguishing between, (41) 842.

spp., fermentation of sugar by, (48) 203.

Penicillium—Continued.

spp., growth inhibiting factors, (49) Iowa 722.

spp. in corn meal, (46) 356.

spp. in soil, activities, (50) 620.

spp., notes, (46) 447, 653.

spp. on cranberry, (44) Mass. 848.

spp. on moldy grain, (43) 445.

spp. spore germination, effect on acidity, (49) 125.

spp., utilization of citric acid by, (50) 630.

Pennisetum—

North American species, (45) 122.

setosum, notes, (49) Guam 427.

spp. as forage crops, Fla. (41) 37, 528.

typhoideum, new disease of, (48) 47.

Pennsylvania—

College, notes, (41) 499, 700, 900; (42)

198, 499, 696, 798; (43) 100, 200,

498, 599, 700, 900; (44) 397, 497,

700; (45) 98, 700; (46) 97, 197,

700; (47) 99; (48) 194, 600; (49)

99, 198, 498, 900; (50) 599, 699.

Institute of Animal Nutrition, (41)

600; (43) 498; (44) 299; (47)

400.

State Veterinary Medical Association. proceedings, (49) 782.

Station, author index of publications, (50) 95.

Station, notes, (41) 499, 700, 900;

(42) 198, 499, 798; (43) 100, 200,

599, 700, 900; (44) 397, 497; (45)

98, 700; (46) 97, 197, 397, 700;

(47) 99, 699; (48) 99, 194; (49)

498, 900; (50) 699.

Station, report, (43) 598; (44) 795; (50) 496.

Station, report of director, (49) 298.

Station, two years of research, (47) 497.

Pennycress, garlic-scented weed new to Britain, (50) 439.

Penstocks, economic design, (42) 572.

Pentalonia nigronervosa, notes, (49) 451.

Pentaptera paniculata, distribution and characters, (50) 40.

Pentatoma sayi, studies, (41) U.S.D.A. 355.

Pentatomoidea of Illinois, (41) 456.

Pentosans—

destruction by molds, (50) 110.

determination, (42) 112; (46) 112.

determination in silage, (45) 502.

digestibility, (47) Tex. 471.

distribution in corn plant, (49) 201.

relation to hardness of plants, (46) 443.

Pentose detection, (50) 803.

Pentose sugars, reduction and dehydration, (46) 26.

Pentoses, determination, (46) 112.

Pentoses, fermentation by molds, (48) 203.

Pentstemons and *Antirrhinums*, handbook, (45) 838.

- Peonies, new, descriptive list, (43) 240.
 Peonies, varieties, (48) Can. 38.
 Peony bud rot, (45) 752.
 Peony diseases, (48) 242; (50) 354.
 Peony pollen, preservation, (41) 343.
 People's Commissariat of Agriculture, activity, (49) 292.
 Peperomia pellucida, use for greens, (42) 138.
 Pepino, vitamin C in, (49) 563.
 Pepper—
 adulteration, detection, (42) 112, 415.
 anthracnose, studies, (41) 543.
 beetle attacking, (41) N.Mex. 159.
 black fruit disease, (50) 447.
 blight, relation to soil moisture, (46) N.Mex. 346.
 blossom rot, (42), 145.
 Chile, wilt disease, (43), N.Mex. 347.
 die-back, notes, (42) 145; (43) 444; (45) 48.
 diseases, notes, (41), 745; (43) 45, Ariz. 749; (45) Ga. 47, 843; (49) Ga. 346.
 fruit rot, notes, (47) Ga. 444.
 Fusarium wilt, (42) N.Mex. 844.
 improvement in India, (41) 522.
 leaf spot, notes, (41) Fla. 543.
 long, adulterant for black pepper, (42) 415.
 maggot, studies, (49) N.J. 356.
 mosaic disease, (45) Ga. 47.
 seed sterilization tests, (49) Ga. 346.
 seedlings, damping-off, prevention, (49) Ga. 347.
 soft rot, notes, (45) N.C. 443; (48) 244.
 tree, undescribed fungus on, (47) 652.
 weevil, notes, (42) 159.
 wilt, cause, (49) 648.
 Peppergrass, eradication, (44) Colo. 335.
 Peppers—*see also* Chili.
 bell, beetles affecting, (48) 652.
 culture and recipes, (44) U.S.D.A. 761.
 culture experiments, (48) V.I. 340.
 fertilizer experiments, (49) Ga. 531.
 fertilizer experiments in India, (42) 517.
 hardening process in, (46) Mo. 827.
 irrigation, effect on yield, (44) Ill. 836.
 lime requirements, (46) R.I. 233.
 methods of cultivating, (42) 444.
 mite disease affecting, (44) Hawaii 60.
 pimiento and bell, production, (46) Ga. 538.
 selection studies, (45) N.Mex. 236.
 yield as affected by irrigation, (50) Mo. 15.
 Pepperwort, hoary, eradication, (49) 831.
 Pepsin—
 activation as affected by H-ion concentration, (43) 611.
 and rennin, comparison, (48) 708.
 as affected by heat, (45) 880.
 Pepsin—Continued.
 determination, (42) 204; (48) 611.
 digestion of proteins by, (44) 110; (45) 411.
 in calf fetus, (44) 865.
 in pollen, (48) 728.
 preparations for cheese making, (42) 566.
 proteolytic activity, use of edestin in determining, (45) 504.
 v. rennet in cheese making, (42) Calif. 876; (44) 274.
 Peptone—
 autolized, effect on growth of excised corn root tips in dark, (49) 627.
 effect on indol formation by *Bacillus coli*, (46) 180.
 intoxication, studies, (42) 271.
 preparation, (43) 502.
 quantitative separation, (48) 312.
 Perchlorates, estimation, (41) 411, 803.
 Perchloric acid, use in nitrogen determination, (46) 615.
 Peregrinus maidis in Hawaii, (42) 249; (48) Hawaii 355.
 Peregrinus maidis, resistant corn varieties, (41) Hawaii 137.
 Perfume and aromatic plants, (42) 43.
 Perfumes—
 and cosmetics, treatise, (50) 308.
 artificial, treatise, (42) 8.
 chemistry, (46) 308; (48) 107.
 natural and synthetic, (47) 711.
 production in French colonies, (49) 389.
 review of literature, (45) 9, 720.
 Pergandea, new genus, erection, (41) 259.
 Pericarditis, purulent, in fowl, (44) 881.
 Periconia pycnospora, description, (49) 445.
 Peridermium—*see also* Cronartium and White pine blister rust.
 cerebrum, distribution and life history, (47) 356.
 elatium, alternate hosts, (45) 548.
 harknessii, notes, (46) 150.
 hydrangeae n.comb., description, (45) 548.
 pini, control, (43) 755.
 pini, life history, (41) 752.
 pini, reinfection of pines with, (45) 549.
 pini, relation to Cronartium, (42) 51.
 pini, transmission, (43) 449.
 spp., facultative heteroecism in, (45) 548.
 spp. of pines, notes, (47) 355.
 strobi and Cronartium ribicoli, relation, (50) 150.
 strobi, notes, (43) 552.
 Peridermiums, sexual cell fusions, (43) Pa. 544.
 Peridermia phytonomi n.sp., description, (50) 260.
 Peridroma saucia, *see* Cutworm, variegated.
 Peridroma sp., notes, (43) U.S.D.A. 352.

- Perigrapha praeses*, life history, (44) 653.
Perilampus batavus n.sp., description, (43) 259.
Perilampus, undescribed planidium of, (48) 360.
Perilitus—
 eleodis, notes, (49) Nebr. 659; (50) 850.
 eleodis, parasitism, by, (46) 355.
 spp., notes, (48) 57.
Perilla, culture experiments, (41) Ariz. 331.
Perilla, seeding tests, (46) Conn.State 332.
Perillus bioculatus, life history and biology, (50) 755.
 Periodicity in nuclear and cell division, (42) 131.
Periplaneta americana, *see* Cockroaches, American.
Periplaneta australasiae, control, (42) Minn. 358.
Periploca, new genus, erection, (42) 157.
Perisporiaceae in South Africa, key, (44) 642.
Perissopterus zebra, notes, (43) 252.
Perisothrips, new genus, erection, (42) 154.
Perkinsiella saccharicida, notes, (43) 450; (48) Hawaii 355.
Perkinsiella saccharicida, parasites of, (43) 661.
Perkinsiella vitiensis, notes, (43) 52.
 Permanganate, use in Kjeldahl method, (44) 801.
 Permanganate-oxalate titrations, effect of filter paper, (46) 805.
 Permeability—
 alterations at freezing temperature, (43) 226.
 and conductivity, (47) 522.
 as affected by salt solutions, (47) 20.
 as affected by same substance as cation and anion, (48) 727.
 cell, relation to immunity production, (43) 382.
 changes produced in, (46) Del. 628.
 changing, in the peach, (45) Del. 626.
 conductivity as measure, (41) 631, 819.
 determination, (42) 227.
 determination and measurement, (44) 822.
 effect of wounding and oxygen withdrawal, (47) 327.
 of citrus leaves, (46) 432.
 of peach tissue, factors affecting, (48) Del. 623.
 of plant cells, (43) 821.
 of plant cells, effect of anions, (46) 126; (47) 30.
 of plant cells, effect of cations, (47) 31.
 of plasma membrane as affected by light, (42) 227.
 of plasma, progressive changes in, (44) 822.
 relation to availability of plant food, Del. (41) 132; (44) 424.
 Permeability—Continued.
 relation to geotropic response, (41) 725.
 selective, in seed coats, (48) 329.
 soil, factors affecting, (44) 418.
 soil, measurement formula, (42) 780.
 studies, (41) 329, 525, 631, 819; (43) 225; (44) 223; (45) 733; (47) 424.
 Permian Red Beds of Oklahoma, phosphate in, (50) 218.
 Permutit, effect on nitrification, (45) 621.
 Permutit for softening water, (41) N.Dak. 89.
 Peroid experiments, (47) 749.
Peromyscus, subspecific hybrids in, (50) 822.
Peromyscus, variations in, (41) 175.
Peronea minuta, *see* Fireworms.
 Peronospora—
 calotheca, specialization in, (43) 653.
 control, (42) 450; (44) 849; (47) 546, 749.
 distribution in Switzerland, (46) 545.
 effusa, notes, (46) 45; (49) Tex. 442.
 gossypina, notes, (45) 649.
 hyoscyami, notes, (44) 449; (46) 651; (48) 454.
 maydis, (45) 844.
 n.spp., notes, (43) 653.
 on grapes, (45) 653.
 on grapevines, fungicide tests, (42) 353.
 outbreaks, reporting, (44) 849; (45) 444.
 parasitica, dimensions of conidia, (45) 54.
 parasitica, notes, (42) 46; (45) 546, 842.
 schachtii on sugar beets, (46) 450.
 schleideni, notes, (43) 243.
 schleideni, perennial mycelium in, (46) 847.
 schleideniana, notes, (44) 842; (45) 47; (46) 145.
 spinaciae, studies, (44) 647; (47) 752.
 spp., descriptions, (43) 248.
 spp., viability in seed, (43) 550.
 studies, (47) 45.
 trifoliorum, notes, (49) 542; (50) 447.
 viciae, notes, (45) N.C. 443.
 viticola, *see* Grape downy mildew.
 Peronosporaceae, studies, (42) 350.
 Peroxid associated with oxidizing systems in plants, (41) 203.
 Peroxidase—
 activities of plants, Del. (41) 132; (44) 424.
 determination in blood, (45) 9.
 in fresh and dried vegetables, (41) 202.
 in milk, determination, (41) 616; (47) 505.
 in remade milk, (47) 111.
Perrisia affinis on violets, (43) 661.
Persea schiedeana, notes, (42) 537.
 Persimmon bark canker, notes, (45) 842.

Persimmons—

- Chinese, vitamin C in, (49) 563.
 diseases and insect pests, (42) Calif. 346.
 Japanese, culture experiments, U.S.D.A. (47) 438; (48) 235.
 oriental, culture in United States, (42) Calif. 346.
 ripening, (44) 443.
 storage, studies, Calif. (42) 831; (48) 535.
 time for transplanting, (43) Mo. 142.
 Peruvian bark residue, fertilizing value, (44) 25.

Pest control, legal aspects, (47) 552.

Pest law of Colorado, (50) 151.

Pestalozzia—

- guepini, demonstration of numerous strains, (49) 523.
 guepini, description, (45) 547.
 guepini on Liberia coffee, (42) 145.
 lignosus on Para rubber, (42) 145.
 on ferns, (46) 647.
 palmarum, notes, (41) 758.
 scirrofaciens n.sp., description, (46) 150.
 sp. on pine needles, suppression of molds during incubation, (47) 647.
 spores, selection, (45) 339.
 spp., notes, (45) 653; (47) 44, 547.
 theae, notes, (47) 754.
 theae, treatment, (48) 150.
 truncata, studies, (42) 51.
 uvicola, notes, (47) 546, 839.
 Pests of farm and forest, treatise, (48) 749.

Petroleum—

- crude, effect on soy beans, (42) 435.
 effect on soil flora, (49) 19.
 genesis of, (41) 711.
 insecticides, experiments, (44) 651.
 products, substitution of gas for, (43) 86.
 residuals, characteristics, (44) U.S. D.A. 85.

Pe-tsai, see Cabbage, Chinese.

Petunia—

- disease, new, (43) 544.
 fungus disease, studies, (43) 447.
 hybrids, studies, (43) 222.
 Phytophthora disease, (41) 656.
 polymorphism in, (50) 631.

Peziza oenotherae, synonymy, (48) 848.

Pfeiffer's bacillus, growth studies, (46) 78, 79, 80.

Phacidiella discolor, notes, (48) 350.

Phaenacantha australica, notes, (44) 653; (46) 246.

Phaenodiscus aeneus, notes, (43) 252.

Phaenogenes—

- ater, notes, (44) U.S.D.A. 163.
 (Centeterus) ineptifrons n.sp., description, (41) 63.

Phaeophytin in silage, (50) 268.

Phagocytosis—

- effect of vitamin deficiency, (49) 280.
 of blood as affected by citrates, (41) 187.

Phakopsora zizyphi vulgaris, notes, (43) 152.

Phalaenae, catalogue, (44) 550.

Phalaenoididae, catalogue, (44) 550.

Phalaris bulbosa, see Canary grass.

Phalonia cephalanthana n.sp., description, (45) 156.

Phaneropterae n.g. and n.sp., description, (46) 559.

Pharcidia lichenum, lime-dissolving fungus, notes, (42) 336.

Pharmaceutical analysis, treatise, (49) 407.

Pharmacopoeia of United States, (42) 566; (46) 178; (47) 483; (48) 480.

Pharmacy, yearbook, (42) 379.

Phaseolin—

digestibility, effect of cooking, (45) 763.

nitrogen distribution in, (42) 707.

nutritive value, (42) 756.

Phaseolus—

inheritance in, (41) 821.

lunatus, hydrocyanic acid content, (42) 7.

morphological and physiological characters, correlation, (41) 224.

spp., studies, (42) 435.

Phasiops flava, notes, (49) 657.

Phassus (?) damoor, notes, (43) 450.

Phatnoma, notes, and new species, (41) 551.

Phaulothrips, new genus, erection, (42) 154.

Pheasant—

and Golden Campine hybrids, sterility, (41) 472.

ring-necked, food habits, (45) 755.

Pheasants—

Chinese, effect on corn yield, (44) U.S.D.A. 157.

hybridization, (47) 667.

monograph, (45) 851; (48) 550.

Pheidole megacephala, notes, (42) 754.

Pheidole sp., notes, (48) 651.

Phellomyces sclerotiphorus, notes, (45) 447.

Phenacetin, effect on catalase production (42) 259.

Phenacoccus hirsutus—

life history and control, (47) 851.

notes, (45) 656; (47) 254, 255; (48) 552.

Phenol—

action on fixed rabic virus, (45) 684.

bactericidal effect on tetanus, (44) 780.

coefficients, (45) 881.

determination, (43) 614; (44) 10; (45) 806.

disappearance from soils, cause, (45) 813.

disinfecting power, (43) 79.

effect on Botrytis spores, (45) 821.

effect on rabic virus, (46) 278.

- Phenol—Continued.
 excretion as affected by diet, (44) 563.
 germicidal value, (47) 383.
 production as affected by work, (44) 864.
 red, use as indicator, (47) 803.
- Phenological—
 conditions, relation to amount of seed, (42) 511.
 effect of the sea on plants, (43) 523.
 literature, recent, (42) 511; (44) 17.
 observations, (44) 17, 811; (50) 616.
 observations in British Islands, (43) 17.
 observations in Europe, (42) 511.
- Phenology—
 of Nova Scotia, (47) 210.
 studies in, (46) 434.
- Phenolphthalein—
 determination, (44) 11.
 substitutes for, (42) 504.
- Phenols—
 excretion by calves, (47) 76.
 in sheep dips, determination, (45) 316.
 in water, detection, (45) 716.
 monohydric, determination, (49) 311.
 toxicity for *Sterigmatocystis nigra*, (50) 245.
- Phenolsulfonphthalein salts, effect of phosphates on color, (43) 313.
- Phenolsulphonic acid reaction for nitrate determination, (42) 414.
- Phenolut as a disinfectant, (41) 875.
- Phenylalanin, effect on starch hydrolysis, (46) 707.
- Phenylhydrazin—
 method of estimating, (46) 112.
 reaction, modification, (42) 112.
- Phenylhydroxylamin, preparation of, (44) 112.
- Philbalothrips, new genus, erection, (42) 154.
- Philaenus—
leucophthalmus fasciatus, notes, (45) Mich. 251.
lineatus, abdomen and genitalia, (50) 844.
lineatus, life cycle, (46) Conn.State 154.
- Philephedra broadwayi, notes, (47) 255.
- Philippine College of Agriculture, notes, (41) 500; (46) 398.
- Philippines, University of, notes, (44) 900.
- Philotrypesis javae n.sp., notes, (42) 56.
- Phlebotomus spp., bionomics, (47) 853.
- Phlebotomus vexator, notes, (41) 259.
- Phlegethontius sexta—
jamaicensis, notes, (49) 53.
 setae of larvae, (44) Ky. 550.
- Phlegmon, treatment, (42) 566.
- Phleum spp., analyses, (41) Wyo. 333.
- Phlobatannins in plant tissue, (50) 427.
- Phloeosinus—
enixus n.sp., description, (46) Miss. 462.
 spp., notes, (44) 256.
- Phloeothripidae, key, (41) 847; (48) 552.
- Phlorizin—
 effect on carbohydrate metabolism, (42) 557.
 effect on metabolism, (41) 68.
 oxidase acting on, (46) 825.
- Phloroglucin test for formaldehyde, degree of alkalinity necessary, (43) 804.
- Phloroglucinol, method of preparation, (42) 505.
- Phlox drummondii—
 flower form and color, (44) 428.
 synthesis of full coloration, (46) 723.
- Phlox—
 inheritance of form and color, Pa. (47) 437; (50) 430.
 varieties, (48) Can. 38.
- Phlyctaenia—
ferrugalis, see Celery leaf-tyer and Greenhouse leaf-tyer.
rubigalis, natural enemies, (48) 357.
 studies, (45) 746.
- Phlyctenodes stictalis, life history and habits, (49) 253.
- Phoenicococcus marlatti, studies, (45) 757, 758.
- Phoethornis Swainson, orthography, (41) 547.
- Pholiota adiposa on blazed trees, (46) 151.
- Pholus achemon, studies, (43) 453; (49) 154.
- Phoma—
alternariaceum, proposed name, (47) 48.
apicola, description, (47) Mich. 447.
apicola, notes, (45) Mich. 241.
apicola on celery, (44) 843.
 artificial culture, (45) 747.
betae, notes, (42) 46; (46) 450.
citricarpa, notes, (48) 149.
destructiva, notes, (47) 48, U.S.D.A. 449, 753; (49) Ga. 346.
 disease, new, of cotton, (47) 350.
insidiosa, notes, (48) 453; (50) 148.
lingam, notes, (42) N.Y.State 350; (43) 46, 654; (44) Conn.State 150; (47) U.S.D.A. 149.
liniperda n.sp., description, (49) 45.
musae n.sp., description, (41) Hawaii 153.
musae, notes, (44) Hawaii 47; (46) Hawaii 647; (50) 752.
napobrassicae, studies, (41) 657.
oleracea, notes, (46) 543.
omnivora, notes, (43) 243.
pomi, control, (49) Ohio 648.
 rot of tomato, (41) 156.
solanicola, notes, (50) 248.
 sp., notes, (45) 649; (46) 454; (48) 46, Del. 46, 547.
 sp. on coffee, (43) 247.
 sp. on Cupressus, control, (43) 156.
 sp. on papaw, (41) 450.
 spp., notes, (44) 842; (45) N.C. 443; (47) 44, 348, 547; (49) 149, 548.
theobromae n.sp., notes, (50) 42.

Phomopsis citri—

- control, (48) Fla. 849, U.S.D.A. 849; (50) 149.
- notes, (42) Calif. 842; (43) 550; (45) 547; (46) 453; (47) Calif. 651; (49) Fla. 838.
- temperature relations of growth, (49) 540.
- utilization of citric acid by, (50) 630.

Phomopsis—

- juniperovora n.sp., description, (45) 548.
- mali, notes, (48) Calif. 541.
- pseudotsugae affecting Japanese larch, (49) 446.
- pseudotsugae n.sp. on Douglas fir, (46) 244; (47) 652.
- pseudotsugae, notes, (47) 154.
- sp., notes, (47) 348.
- sp. on cranberry, (44) Mass. 848.
- spp., notes, (42) 630.
- vexans, notes, (44) La. 844; (49) Va. Truck 233.
- vexans, studies, (41) Fla. 542; (42) 148.

Phonolite, action as fertilizer, (45) 216.

Phonolite, fertilizing value, (44) 214.

Phora fasciata, parasitism by, (45) 61.

Phoradendron spp., notes, (42) 354.

Phoradendron spp., sap concentration, (41) 632.

Phorbia—

- brassicae, *see* Cabbage maggot.
- ceparum, *see* Onion maggot.
- fusciceps, *see* Seedcorn maggot.
- rubivora, notes, (49) Oreg. 555.

Phormia—

- azurea, studies, (42) 157.
- regina, flight distances, (41) 259.
- regina, summary, (45) Tex. 455.
- spp., attacking nestling birds, (44) 553.

Phormidium foveolarum, effect of colored lights on, (43) 526.

Phormium—

- determination of flexibility, (46) 230.
- tenax production in New Zealand, (47) 530.
- tenax, yellow leaf disease in, (48) 348.

Phorocera—

- claripennis, notes, (50) U.S.D.A. 258.
- claripennis, parasitism by, (43) 759.
- doryphorae, parasitism by, (44) 255.
- meracanthae n.sp., description, (46) 57.

Phorodon galeopsidis, notes, (41) 756.

Phorodon humuli, *see* Hop aphid.

Phosgene, action on ricinolein, (47) 716.

Phosgene, insecticidal value, (44) U.S.D.A. 56.

Phosphate—

- beds of Islands of Madagascar, value, (48) 822.
- beds of Uinta Mountains, (41) Utah 518.

Phosphate—Continued.

calcined, fertilizing value, (41) Mo 628.

deposits—

- economic use, (48) 195.
- foreign, (45) 24.
- of Galicia and Palestine, analyses, (42) 430.
- of South Australia, analyses, (42) 430.
- of Switzerland, (42) 220.
- on Nauru and Ocean Island, (48) 24.

fertilizers, methods of distribution, (48) 195.

fertilizers, studies, (49) Wis. 622.

industry, (41) 425.

inorganic, in blood, distribution, (47) 466.

inorganic, in blood, in rickets, (47) 467.

inorganic, in urine, determination, (45) 508.

ion concentration for barley, (48) Calif. 523.

ion relation to rickets, (46) 471.

limestones of New Zealand, (41) 326.

needs, determining, (48) 195.

neutral, description, (49) 517.

nodules as direct fertilizer, (42) 125.

of lime, *see* Calcium phosphate.

precipitated, available phosphoric acid in, (44) 801.

requirement of Indian soils, (41) 515, 814, 816.

requirement of soils, relation to phosphoric acid in oats, (43) 519.

requirements of potatoes, (44) 636.

resources of world, (47) 817.

Rhenania—

- fertilizing value, (48) 822.
- manufacture and value, (48) 622.
- studies, (48) 121.

rock, as mineral feed substitute, (44) Ohio 175.

rock, availability, effect of—

ammonium sulphate, (46) Ohio 429.

fertilizers, (45) Ohio 118.

green manure, (46) 320.

leaching, (43) 427.

rock—

availability in acid soil, (47) Ark. 727.

composting, (44) 217.

composting with organic ammoniates, (47) Ga. 420.

composting with sulphur, (42) Va. 429; (48) 219.

effect of nitrification, (41) 324; (46) Ohio 429.

effect of sulfonation, (41) 324; (42) 125, 429; (46) Ohio 429.

effect on lime requirements of soil, (44) Pa. 723.

Phosphate—Continued.

rock—continued.

- effect on nitrate production, (43) Ill. 214.
 - effect on phosphoric acid removal by crops, (47) Tex. 422.
 - effect on quality of hay and pasture, (48) 521.
 - fertilizing value, (41) Del. 137; (43) 817; (45) Mo. 24; (49) 20.
 - finely ground, use, (46) 21.
 - Florida soft, (41) 323.
 - foraging power of plants for, (48) 195.
 - in Morocco, (42) 220.
 - in Tennessee, mining and washing, (50) 323.
 - industries in Southern States, (42) 525.
 - manganese content, (41) 521.
 - occurrence, mining, and uses, (48) 822.
 - processes for treating, (41) 628.
 - production, (42) 19.
 - production and consumption in 1918, (41) 23, 817.
 - production and export, (45) 24; (46) 219.
 - production and sale, (46) 430.
 - production in United States, (44) 130; (50) 727.
 - resources in United States, (45) 816; (49) 124.
 - smelting, (43) 629.
 - solubility studies, (42) 125; (47) 516; (49) 118; (50) 412.
 - solvent effect of organic matter, (46) 21.
 - sources and use, (42) 525.
 - situation in Germany, (49) 517; (50) 323.
 - solubility in soil, (48) 18.
 - supply of India, (41) 816.
 - Trichinopoly, for rice, (49) 124.
- Phosphated manure, use, (44) 514.
- Phosphates—*see also* Superphosphates.
- absorption by soils, (42) Calif. 811.
 - acid and native, relative availability in presence of lime, (43) 26.
 - and limestone, fertilizing value, (47) 727.
 - and potash, comparative value for grain, (41) 825, 826.
 - availability—
 - effect of lime, (45) Wis. 217; (46) 24.
 - factors affecting, (43) 629; (47) 817.
 - for soy beans, (41) N.J. 23.
 - studies, (41) 131; (44) 421.
 - behavior in soils, (50) 723.
 - briquetting, (46) 718.
 - citric solubility, relation to crop yield, (48) 521.
 - color reaction for, (44) 611.

Phosphates—Continued.

- comparison, (41) Mass. 21, N.J. 23, Del. 137, 229, 230, 425, 515, Can. 516, 518, Fla. 527, Mo. 624, N.C. 625, Mo. 628, 723, 813, 816; (42) 20, 107, 125, 218, 720, Minn. 723, 814; (43) 26, Md. 122, Ga. 136, Ohio 324, 629, La. 630, Mo. 721, Minn. 815, 816; (44) R.I. 23, 319, 627, Ala.Col. 722; (45) Ga. 37, N.Dak. 217, 425, 728; (46) 315, Mo. 315, 319, S.C. 717, 821; (47) S.C. 23, Miss. 217, N.C. 520; (48) 122, Can. 323, 427, 517, 521, Mo. 616, Del. 620; (49) Pa. 214, Oreg. 510, Ky. 516, 623, 816; (50) 19, N.Y.State 422, Pa. 423, Pa. 424, 723.
- composting experiments, (47) 815.
- conditions in European market, (42) 814.
- consumption in Europe, (42) 815.
- disaggregated, fertilizing value, (49) 816.
- effect on—
 - action of alpha-crotonic acid, (43) 131.
 - colorimetric values of pH, (43) 313.
 - growth and maturity, (48) 195; (49) 726.
 - maturity of cotton, (43) Ga. 137.
 - nitrification in soils, (43) Tex. 725.
 - plants, (48) 426.
 - soil acidity, (47) 518, R.I. 519; (48) Ky. 116; (50) 17.
 - soil bacteria, (41) 721.
 - soil solubility, (41) Mich. 512.
- efficiency, effect of liming and time in soil, (50) 19.
- fertilizing value, (41) Mich. 323; (42) 107, 125, 218, 220, Wis. 327, 328, 720, 721, Minn. 723; (44) Ky. 511; (46) 216, 817; (47) Minn. 124; (48) N.Dak. 29, Mo. 616; (50) Minn. 121.
- fertilizing value on peat soil, (46) 216.
- flour, and bone meal, comparison, (49) 123.
- for Kentucky soils, (45) 728.
- for pasture improvement, (46) 624.
- formation as affected by reaction, (44) 218.
- ground mineral, fertilizing value, (49) 214.
- in blood of infants, (49) 58.
- in blood plasma, determination, (47) 714; (50) 615.
- in Hawaiian soils, (50) Hawaii 216.
- in Permian Red Beds of Oklahoma, (50) 218.
- in soil, solubility, (46) 320.
- injury to soy beans, (41) 525.
- insoluble—
 - effects of composting on availability, (43) Ga. 127.
 - mineral, comparison, (47) 623.

Phosphates—Continued.

insoluble—continued.

- transformation into soluble forms, (47) 27, 219.
- valuation, (49) 202.
- manufacture, acid decomposition process, (46) 718.
- market conditions in Europe, (42) 814.
- mineral, citric solubility, (48) 24.
- mineral, utilization by crops, (48) 427.
- mining and manufacture, (41) 423.
- of Ocean Islands, (45) 729.
- precipitated, fertilizing value, (41) 720.
- production, (44) 424, 627.
- raw, use, (50) 323.
- reaction with calcium carbonate, (41) 720.
- recovery from fecal matter, (41) 723.
- residual effect, (41) N.C. 625.
- solubility as affected by lime, (43) 629.
- solubility, rate, (48) 520.
- solubility, studies, (42) 125; (45) 217.
- soluble—
 - behavior of plants toward, (46) 627.
 - in soils, test, (45) 412.
 - in soils, test, correction, (46) 310.
 - manufacture and function, (43) 424.
 - retention in soils, (45) 331; (46) 121.
- substitutes for, (49) 215.
- toxicity to soy beans, (41) N.J. 27.
- Vivianite and Vesta, fertilizing value, (42) 22.
- world shortage in, (41) 628.

Phosphatic—

- depletion in Bihar soils, theory concerning, (49) 815.
- fertilizer resources of Uruguay, (42) 328.
- fertilizers—
 - comparative availabilities, (49) 123.
 - composition and action, (43) 26.
 - for poor rice soils, (44) 128.
 - manufacture, developments in, (50) 817.
 - treatise, (42) 220.
- manures, use on Indian soils, (42) 429.
- nodules of Trichinopoly, (41) 131.
- slag—
 - accessory elements of, (49) 215.
 - alkalinity, (47) 623.
 - analyses, (43) 127.
 - artificial, (41) 628.
 - as affected by fluorspar, (46) 22.
 - as affected by rain, (45) 624.
 - as source of lime, (47) Ohio 624.
 - constitution and fertilizing value, (50) 323.
 - different grades, comparison, (41) 723.
 - effect on grassland, (45) 521; (47) 26.
 - effect on hay and root crops, (48) 122.

Phosphatic—Continued.

slag—continued.

- effect on lime requirements of soil, (44) Pa. 723.
- effect on quality of hay and pasture, (48) 521.
- effect on wheat, (48) 723.
- fertilizing value, (42) 721; (46) 23; (48) Can. 323; (49) 20; (50) 122, 723.
- for pasture improvement, (43) 519; (46) 624, 625.
- increasing supplies, (43) 519.
- interim reports, (48) 121, 122.
- manganese content, (41) 521.
- relation to compounds in lime phosphoric acid system, (49) 214.
- solubility, (45) 520.
- solubility as affected by lime, (46) 23.
- use in concrete highways, (42), 781.
- v. superphosphate, (43) Ohio 324.
- Phosphatids, determination, (41) 116; (44) 505.
- Phosphatids, structure and significance, (46) 11.
- Phos-pho-germ, fertilizing value, (43) 27; (45) 817.
- Phospholipins of blood and liver in rickets, (48) 65.
- Phosphomolybdic acids, chemistry of, (44) 112.
- Phospho-organic reserves in green plants, (43) 525.
- Phosphoric acid—
 - absorption by plants, (46) 627.
 - activity as affected by lime, (45) 24; (48) 427.
 - ammonia, and potash, proportions for fertility, (49) Ohio 323.
 - and potash, fertilizing value, (44) 214.
 - and starch, compound, (45) 204.
 - assimilation, (44) 421, 722.
 - assimilation—
 - effect of humus acids, (47) 322.
 - factors affecting, (50) 423.
 - in animals, (45) 773.
 - variation in, (47) Tex. 218.
 - availability, (50) Hawaii 217, 619.
 - availability, factors affecting, (45) 26; (48) 427, 520.
 - availability, increasing, (50) 818.
 - available in soils, determination, (49) 111, 203; (50) 118.
 - balance, (44) 317.
 - commercial, composition, (47) 804.
 - determination, (43) 115, 804; (46) 415.
 - determination—
 - in fruit juices, (49) 805.
 - in organic compounds, (48) 205.
 - in sewage, (42) 12.
 - modified method, (47) 310.

Phosphoric acid—Continued.

determination—continued.

of active value in soil, (45) 214;
(47) 24.

value, (50) Hawaii 217.

distribution in blood of children, (46)
259.

effect on maturity of tomatoes, (49)
234.

effect on soil solubility, (41) Mich.
513.

effect on wood distillation, (47) 208.
experiments, (45) 520.

extracts, enriching, (46) 718.

fertilization, (45) 623; (46) 424;
(48) 219; (50) 817.

fertilization—

history, (50) 424.

necessity on German soils, (48)
821.

of moor soil, (46) 215.

results, (46) 219, 220, 821.

studies, (47) 727, 816; (50) 218.

fertilizers, availability on swamp soil,
(41) 813.

fertilizers, shortage in Germany, (49)
215.

fertilizing value, (43) 26; (44) 319,
Del. 420, 815; (45) Del. 622; (48)
Del. 620, Pa. 819; (49) 815.

fixation and dissolution in soil, (41)
720.

fixation in soils, (42) Va. 424; (49)
Tex. 320.

for pasture improvement, (45) 623.

from triplite, (41) 817.

in blood during mental work, (49) 560.

in blood, forms, (50) 772.

in cane juices, (49) 120.

in humus soils, nature, (46) 715.

in liquid sewage, (48) 622.

in oats as affected by fertilizers, (43)
322.

in soil and water, studies, (47) 20.

in soil, changes in, (48) Fla. 215.

in soil, effect of lime, (42) 524.

in soil, relation to pot experiments,
(45) Tex. 22.

in wheat flour, (48) 311.

insoluble, in superphosphates, (50)
712.

manufacture, (46) 718; (47) 726.

manufacture, volatilization process,
(50) U.S.D.A. 521.

need and use by plants, (46) 224.

nutrition of plants, laws governing,
(48) 426.

production, (50) 818.

production from phosphate rock, (43)
629.

production, progress in, (47) 727.

question, critical discussion, (50) 218.

removed by crops, (47) Tex. 422.

requirements of soil shown by plant
analysis, (44) 816.

retention in soils, (45) 331.

reversion, (45) 728.

Phosphoric acid—Continued.

reverted, fertilizing value, (43) 428.

solubility, (45) 725.

solution by plants and fertilizers, (47)
817.

solution, effect on bud growth of cut-
tings, (49) 834.

sources in Prussia, (44) 815.

supply of German soils, (49) 624.

test for, (49) 407.

use in Bavaria, (43) 629.

use in Germany, (42) 516.

use to prevent nitrogen loss from
manure, (44) 817.

Phosphoric oxid—

citric soluble, determination in basic
slag, (50) 412.

determination, (41) 411.

determination, sulphate-molybdate
method, (50) 412.

in fertilizers, determination, (48) 503.

relation to antineuritic vitamin in
maize products, (42) 256.

solubility in mixed fertilizers, (46) 520.

Phosphorite—

meal as direct fertilizer, (42) 125.

of Madagascar, composition, (48) 822.

rock, fertilizing value, (45) 816.

Phosphorus—

adsorbed, availability, (50) 213.

and calcium balance in cows, effect of
diet, (47) 875; (48) 477.

and calcium metabolism in children,
(48) 463.

as limiting factor for milk secretion,
(47) 279.

assimilation as affected by silica, (48)
722.

assimilation by corn, (45) 628.

assimilation, factors affecting, (48)
861.

availability of in marsh soils, (42)

Wis. 512.

concentration in blood, effect of sun-
light, (50) 63.

deficient diet, effect, (46) 472, 473.

determination, (48) 710; (50) 196.

determination—

in organic material, (43) 204;

(48) 205; (50) 612.

in soils, (44) 803.

in urine and blood, (44) 613.

method, modification, (48) 111.

Official method, (48) 609.

different forms, availability in nutrient
solution, (41) N.J. 27.

distribution in plants, (42) 229.

distribution on rachitic and nonrachitic
diets, (48) 761.

effect on—

alfalfa, (50) 726.

bearing orchards, (44) Oreg. 837.

cereals, (48) R.I. 518.

meadows, (50) 434.

nitrogen in legumes, (46) 120.

Phosphorus—Continued.

effect on—continued.

- potassium absorption, (47) Calif. 625.
- tomatoes, (49) N.H. 336.
- wheat, (41) Del. 136.
- fertilizing value, (44) Oreg. 719; (47) Mo. 237; (49) S.Dak. 510.
- importance in nutrition, (46) 259.
- in apple trees, (43) N.H. 28.
- in blood serum, relation to rickets, (47) 66.
- in butter, (43) N.Y. Cornell 469.
- in feed, effect on milk yield, (45) U.S.D.A. 274.
- in fertilizer, (45) U.S.D.A. 728.
- in human milk, racial variations, (50) 562.
- in irrigation water, (48) 118.
- in marsh soils, (43) 22.
- in oats and nutritive value, (47) 31.
- in serum, relation to rickets, (46) 165.
- in soils, (47) 21; (50) 321.
- in soils, determination, (49) 420.
- in soils, factors affecting, (41) 326; (45) Ohio 118.
- in soils of Greece, (47) 121.
- in soils of St. Joseph Co., (49) Mich. 16.
- in soils, solubility, (44) Mich. 195.
- in tomatoes, (49) 436.
- in typical diets, studies, (42) 555.
- in vegetables, utilization by man, (47) 763.
- income and outgo on dairy farms, (43) 23.
- inorganic—
 - concentration in blood serum, (48) 564.
 - determination in serum, (47) 13.
 - in blood of children, (49) 764.
 - in blood plasma, (46) 506.
 - in milk, (50) 609.
 - in serum and plasma of adults, (49) 363.
- maintenance requirement in man, (42) 554.
- metabolism—
 - effect of cellulose and protein, (50) 571.
 - effect of cod liver oil, (50) 262, 570.
 - in avitaminosis, (50) 862.
 - in rickets, (50) 669.
 - of dairy cows, (45) 273.
 - of oats-fed horses, (44) 672.
 - relation to milk fat origin, (46) 878.
 - relation to milk secretion, (41) 678.
- movement in soils, (41) 214.
- new method for testing, (42) Wis. 313.
- organic—
 - analysis, (50) 720.
 - determination, (49) 112.

Phosphorus—Continued.

organic—continued.

- in soils, (41) 213; (43) 813; (48) 195; (49) 815.
- in soils of Iowa, (47) 123.
- pentachlorid, effect on soil permeability, (47) 20.
- relation to oral defects, (48) 465.
- removal from soil by drainage, (47) Ky. 122.
- requirements of livestock, (49) Wis. 167.
- requirements of soils, determining, (49) 815.
- retention, effect of cod liver oil and butter, (45) 666.
- role in etiology of rickets, (47) 270.
- salts, effect on quality of potatoes, (46) 441.
- studies, (49) Oreg. 510.
- symposium on, (48) 195.
- traces of, method of determining, (47) 714.
- utilization by plants, effect of silicates, (47) Ohio 423.
- Phosphotungstic acids, chemistry of, (44) 112.
- Phothora vastatrix, notes, (46) 647.
- Photocatalysis, (47) 728; (48) 221; (50) 525.
- Photochemical research, new fields, (44) 610.
- Photographic plates, action of wood on, (48) 730.
- Photometer, tint, use with raw sugars, (43) 714.
- Photometer, types, (45) 503.
- Photoperiodism—
 - effect on plants, (47) 225.
 - in wheat development, (49) Wash.Col. 223.
 - of wheat, (48) 27.
 - studies, (49) 326.
- Photosynthesis—
 - and electronic theory, (45) 821; (49) 519.
 - and respiration, interrelation, (42) 730; (45) 334; (46) 25.
 - development of conceptions, (43) 227.
 - dynamics of, (41) 523.
 - in fresh-water algae, (46) 824.
 - in marine algae, (46) 825.
 - in plants, (44) 517; (49) 728.
 - in Rhodophyceae, (47) 126.
 - in sugar cane, (45) 125.
 - internal factor in, (48) 825.
 - measuring, (41) 524.
 - method of study in land plants, (42) 730.
 - of nitrogen compounds, (48) 221.
 - of plant products, (49) 820.
 - relation to vitamin A in plants, (47) 368.
 - sap density, and water requirements, correlation, (49) 536.
 - studies, (41) 28, 330; (44) 426.

- Photosynthesis—Continued.
 temperature coefficient, (41) 725; (43) 132.
 Photosynthetic—
 activity, development, (45) 428.
 efficiency, (49) 29.
 efficiency and light intensity, (46) 29.
 processes in relation to life, (47) 728.
 Phototaxis, studies, (42) 333.
 Phototheodolite, use in forest surveys, (44) 46.
 Phototropic—
 and geotropic stimuli, path of transmission in oats, (48) 728.
 stimulation, transmission, (43) 132.
 Phototropism—
 explanation, (42) 128.
 in plants, (44) 824.
 relation to swarming of bees, (43) 851.
 studies, (45) 629.
 theory of, (43) 132.
 Phragmidium—
 gedeanum, notes, (46) 829.
 imitans, notes, (46) 143; (49) 44.
 Phragmites communis—
 as emergency feed, (43) 170.
 pseudodonax, studies, (42) 332.
 Phryganidia californica, notes, (41) 258; (42) U.S.D.A. 853.
 Phryganidia caterpillars, instars, (44) 758.
 Phrynetia spinator, studies, (42) 454; (45) 558.
 Phthalate buffers, incompatibilities, (45) 503.
 Phthalates, test for, (50) 507.
 Phthalic anhydride—
 derivatives, (45) 504.
 melting point, (42) 205.
 papers on, (42) 109.
 vapor pressure, (44) 610.
 Phtia picta, control, (49) V.I. 353.
 Phthorimaea—
 glochinelia, studies, (50) 847.
 heliopa on tobacco, (43) 52.
 operculella, *see* Potato tuber worm.
 Phthorophloeus n.spp., descriptions, (46) Miss. 461.
 Phycomyces nitens, sexuality of, (43) 524.
 Phygadeuon sp., notes, (47) Mass. 452.
 Phyllachora, notes, (41) 843.
 Phyllachora sacchari, notes, (46) 45.
 Phyllactinia corylea on oak, (43) 754.
 Phyllobius spp., notes, (42) 851.
 Phyllocoptes—
 cornutus, notes, (48) 654; (49) Pa. 251.
 schlectendali, notes, (44) Oreg. 850.
 toxicophagus n.sp., description, (41) 759.
 Phyllosticta—
 antirrhini, studies, (45) 548.
 caricae-papayae, description, (47) 846.
 cicerella, notes, (49) 45.
 citricola, notes, (45) 842.
 congesta, description, (46) 348.
 gossypina, notes, (45) 649.
 miui on rice, (45) 351.
 n.sp., notes, (45) 651.
 nicotiana, notes, (48) Fla. 646; (49) Fla. 838; (50) 749.
 solanicola, notes, (46) 451.
 solitaria, notes, (41) Ohio 249; (44) 53, Pa. 745, Ill. 839; (45) Mich. 450; (46) 148, 543; (47) Iowa 749; (49) Ind. 754; (50) 750.
 sp., notes, (46) 647.
 sp. on snapdragon, (43) 658.
 spp., notes, (47) 547.
 straminella, notes, (48) 242.
 theobromae, notes, (49) 540.
 theobromicola on cacao, (42) 46.
 Phyllostictina carpogena, origin of cavity in pycnidia, (49) 349.
 Phyllostylon braziliensis wood, present uses, (49) 143.
 Phyllotreta—
 armoraciae, notes, (42) N.J. 849.
 pusilla, studies, (44) U.S.D.A. 257.
 species on grain, (45) 655.
 utana n.sp., notes, (43) 854.
 Phylloxera—
 and reconstruction of vineyards, (47) 255.
 breeding for resistance, (41) 740.
 control, (46) 51.
 disinfection of cuttings and rooted vines, (44) Calif. 752.
 effect on sap acidity, (41) 740.
 in California, studies, (45) U.S.D.A. 55.
 infested vineyards, protection, (44) Calif. 654.
 infested vineyards, reconstitution, (41) 241.
 original habitat, (47) 551.
 problem, (49) 50.
 protection of grapevines from, (49) 655.
 resistant stocks, (46) Calif. 540.
 vitifoliae, notes, (45) U.S.D.A. 55.
 Phymatotrichum omnivorum, notes, (43) 652; (50) Tex. 45.
 Physa fontinalis acuta, notes, (44) 184.
 Physalis longifolia, notes, (50) 648.
 Physalis, overwintering of mosaic on, (47) 349.
 Physalospora—
 baccae, studies, (49) 547.
 cydoniae, notes, (44) Pa. 53; (47) Calif. 649; (50) 449.
 miyabeana n.sp., notes, (9) 548.
 perseae n.sp., description, (50) 354.
 phalaridis n.sp., description, (49) 445.

Physarum—

- chlorinum, notes, (47) 547.
- spp., notes, (45) 144.
- viride rigidum plasmodium, habitat, (49) 242.

Physcia integrata sorechiosa, notes, (45) 653.

Physical fitness, assessment, (47) 164.

Physical tables, Smithsonian, (44) 583.

Physics—

- and chemistry, handbook, (45) 801.
- household, research problem in, (48) 159.
- of flour milling, (44) 168.
- of the air, treatise, (44) 617.

Physiological action and chemical constitution, relation, (47) 203.

Physiology—

- and national needs, (45) 663.
- chemical, treatise, (43) 365; (44) 556; (49) 358.
- dictionary of scientific terms, (45) 299.
- human, biochemistry in relation to, treatise, (49) 559.
- international catalogue, (44) 556.
- of domestic animals, treatise, (46) 681.
- pathological, treatise, (44) 678.
- plant, *see* Plant physiology.
- principles of, (42) 658.
- principles, treatise, (46) 255.

Physocephalus sexalatus, notes, (46) La. 281.

Physoderma zeae maydis—

- notes, (43) 243; (44) U.S.D.A. 446.
- zoospores, destruction by natural enemies, (43) 750.

Physothrips, North American, key, (44) 58.

Phytalus smithi, campaign against, (46) 559.

Phytalus smithi, notes, (44) 57; (45) 661, 762, 853; (46) 534.

Phytamoeba sacchari, proposed name, (49) 444.

Phytase activity, effect of temperature, (45) 612.

Phytic acid of wheat bran, composition, (44) N.Y.State 410.

Phytic acid, synthesis, (44) 309, N.Y.State 410; (45) 202.

Phytin content of foods, (47) 366.

Phytobacter lycopersicum, notes, (49) 149.

Phytodietus fumiferanae n.sp., description, (48) 158.

Phytoecia cylindrica on carrots, (42) 152.

Phytolacca rivinoides, use for greens, (42) 138.

Phytometer method in ecology studies, (41) 327.

Phytomyza platensis on salvia, (50) 661.

Phytomyza sp. on maize, (41) 553.

Phytomyzinae, parasite of, larval development, (47) 762.

Phytomyzophaga albipes n.g. and n.sp., description, (50) 661.

Phytonomus—

- murinus, *see* Alfalfa leaf weevil.
- posticus, *see* Alfalfa weevil.
- spp., notes, (41) 251; (47) Ind. 156; (50) N.Y.Cornell 57.

Phytopathological service—

- for France, (50) 499.
- in Netherlands, (46) 741.

Phytopathology—

- colloid chemistry methods in, (50) 426.
- Portuguese glossary, (50) 345.
- practical applications of, (43) 44.
- sketch history of, (42) 541.

Phytophaga—

- destructor, *see* Hessian fly.
- new, from Africa, (48) 654.
- violicola, studies, (47) Conn.State 155.

Phytophthora—

- arecae, eradication, (45) 48.
- cactorum, notes, (44) Conn.State 149, 648; (47) Pa. 445.
- cactorum, studies, (42) 450; (48) Pa. 48.
- cinnamomi n.sp., description, (49) 150.
- cryptogea n.sp., description, (41) 656; (43) 447.
- cryptogea, notes, (42) 46; (46) 544.
- disease of peony, (45) 752.
- erythroseptica, notes, (41) 748; (44) 447; (45) 447, 752; (48) 146.
- faberi, notes, (43) 156; (46) 845; (49) 540; (50) 149.
- hypolateritia on tea, (42) 647.
- in soil, saprophytic life, (49) 242.
- infestans—*see also* Potato blight, late.
 - conidia, bionomics of, (49) 844.
 - on cucumber, (46) 449.
 - on eggplant, (50) 146.
 - on tomato, (46) 451.

meadii, notes, (45) 48.

n.sp. affecting potato, (41) 655.

nicotianae, notes, (48) 454, Fla. 646; (50) 248.

omnivora, notes, (44) 347.

on cacao, (42) 49.

on Hevea and cacao, (41) 55.

palmivora, notes, (47) 348; (50) 553.

parasitica rhei n.var., description, (48) 453.

rot, control, (49) 839.

sp., on coconut, (43) 151.

sp., on poppy, (43) 49.

sp., on rubber, (42) 145, 542, 741.

spp., comparative studies, (44) 446.

spp., notes, (41) 543; (43) 445, 658; (45) 148, 843; (46) 44, 447, 454, 745; (48) 45; (49) 45.

Phytophthora—Continued.

- syringae, notes, (42) 46.
- terrestria, distribution, (46) 149.
- terrestria, notes, (42) 643; (45) N.C. 443, 449, 546; (49) 44, Calif. 649, 650.
- terrestria on tomatoes in transit, (41) 156.
- terrestria, studies, (42) Calif. 842.
- terrestria, temperature relations of growth, (49) 540.

Phytoptipalpidae, new family, erection, (47) 558.

Phytoptipalpus transitans n.sp., description, (47) 558.

Phytopus sp., notes, (41) 655.

Phytosterols, studies, (50) N.Y.State 408.

Pickering, S. U., biographical sketch, (44) 800.

Pickering sprays, preparation and adhesive properties, (43) U.S.D.A. 843.

Pickles, cucumber, bacteriology, (46) 502.

Pickles, preparation, (44) U.S.D.A. 557.

Picnometer, description, (43) 806.

Picric acid—

- as an agricultural explosive, (46) 887.
- effect on plants, (46) 544.
- for rock and soil blasting, (43) 480.
- purification method, (48) 313.
- use in agriculture, (45) 891.

Pieridae of Argentina, (41) 665.

Pieris brassicae, parasites of, (41) 552; (48) 158.

Pies, digestion, (44) 665.

Pies, fruit, preparation of lower crust, (48) 258.

Pifine meal, feeding value, (47) La. 471.

Pig clubs in Indiana, (43) 195.

Pig houses—

- colony, drawings, (50) 288.
- concrete, construction, (43) 90.
- in France, (42) 590; (45) 591.
- plans, (42) 285.
- portable, (48) 171.
- studies, (41) N.J. 73, 586; (43) 485.
- ventilation, effect on temperature, (45) 394.
- ventilation system, (48) 489.

Pig—

- meals, analyses, (47) N.Y.State 172.
- muscle, antineuritic value, (50) 859.
- muscle, diamino acid content, (47) 610.
- parasites and thumps, (45) U.S.D.A. 788.

Pigeon pea—

- diseases, notes, (41) 745.
- feed, analyses, (44) Hawaii 71.
- root disease, notes, (42) 844.

Pigeon peas—

- culture and use, (46) Hawaii 440.
- natural crosses, (44) 429.
- variety tests, (49) Guam 426.

Pigeons—

- behavior, (43) 67.

Pigeons—Continued.

- color inheritance, (42) 764.
- composition of flesh, (50) 196.
- deprived of vitamin B, metabolism, (48) 467.
- digestive functions, (48) 263.
- diseases and feeding, (42) 779.
- effect of deficient diet on organs, (43) 369, 664.
- effect of vitamins on organs, (45) 467.
- flesh of, feeding experiments, (49) 358.
- flying homer, treatise, (46) 173.
- identical twins in, (47) 68.
- inheritance in, (48) 565.
- involution of thymus in, (42) 165.
- lice on, eradication, (47) U.S.D.A. 255.
- nutritive requirements, (49) 160.
- polyneuritic, as affected by thyroid gland extract, (43) 865.
- polyneuritic, hematology of, (48) 761.
- production of eye color in, (43) 866.
- raising, (47) 75, N.J. 276.
- raising, manual, (49) 297.
- sex-linked characters, inheritance, (42) 764.
- vitamin requirements, (42) 366.
- wild, inheritance in, (43) 67.
- wood, food habits, (41), 454.

Pigmentation—see also Anthocyan, Anthocyanin, and Color.

- effect of colored light, (46) 325.
- effect on action of light on rickets, (47) 270, 271.
- in algae, relation to chlorophyll assimilation, (47) 127.
- in animal fats, relation to vitamin A, (46) 61.
- in fowls, studies, (44) 70.
- in lice, (41) 552.
- in peas, relation to vitamin A, (46) 257.
- of plants, (42) 333; (44) 428.
- relation of flavonol and anthocyanin pigments, (43) 632.
- yellow, of skin, result of diet, (47) 265.

Pigments—

- brown, formation in plants, (49) 26.
- endothia, studies, (44) 222.
- identification in brown-husked corn, (46) 125.
- of adrenals, (45) 64.
- red, in plants, formation, (50) 22a.
- vegetable, formation, (44) 629.
- yellow, and vitamin A, relation, (47) 464, Wis. 464.

Pigpens, see Pig houses.

Pigs—see also Pork, Sows, and Swine.

- abnormalities, (50) 429.
- acid rations for, effect, (46) Iowa 363.
- acid-base balance in, (47) Iowa 772.
- age and chemical development, (50) 569.

Pigs—Continued.

age and weight, effect on gains, Ohio, (41) 271, 272.
 alfalfa meal for, (41) 273.
 alfalfa pasture for, (41) Ariz. 369; (45) U.S.D.A. 575.
 algaroba meal for, (43) 70.
 and corn, price relations, (43) U.S. D.A. 694.
 and pork production in Missouri, (50) 174.
 barley for, (41) 474; (43) Okla. 70, 774, 870.
 barley for, methods of preparing, (45) Okla. 474.
 Berkshire, description, (46) 768.
 Berkshires v. Yorkshires, (49) Can. 68.
 best breeds for bacon, (49) 470.
 birth weight, Ill. (43) 571; (45) 270.
 bone glue for, (43) 173.
 bracken rhizomes for, (41) 270, 271.
 breed tests, (50) Can. 777.
 breeders' annual, (48) 171.
 breeding and care, lessons on, (47) 598.
 breeding and management, (50) N. Dak. 67.
 breeding experiments, (41) Kans. 74; (44) 767; (45) 876; (47) Ark. 775; (48) 868; (50) Can. 470.
 breeding in North Africa, (42) 560.
 breeds—
 and crosses, relative growth, (49) 270.
 and types, (48) U.S.D.A. 171.
 British, (44) 364; (45) 474.
 comparison, (45) Can. 875.
 comparison in Denmark, (49) 170.
 in Porto Rico, (47) 173.
 broom corn seed for, (43) 671.
 calcium compounds for, (42) Ohio 470.
 calcium metabolism, (45) Ohio 570.
 care and management, (48) 693; (49) 270; (50) 174.
 care in health and disease, (49) 377.
 cassava meal v. sweetpotatoes for, (43) 71.
 castration, (50) U.S.D.A. 883.
 citrus fruit rinds for, (41) Md. 570.
 city bred, profits, (43) 695.
 color inheritance, (43) Iowa 71.
 composition, formulas, (48) 167.
 composition, relation to feed consumed, (48) Mo. 664.
 corrected skim milk for, (44) 673.
 cost and rate of gain as affected by ration, (49) Okla. 469.
 cost of raising, (49) La. 271, Ind. 592; (50) Can. 272.
 cost of raising to weaning, N.C. (47) 575, 777.
 cottonseed meal for, (41) 369.
 crossbred, comparison, (50) Can. 776.

Pigs—Continued.

crossbred, errors in feeding experiments, (46) 677.
 crossbreds, value, (49) 170.
 crossbreeding, (50) Can. 369.
 Cumberland, origin and description, (47) 73.
 cycles of production, (44) N.J. 364.
 debittered lupines for, (45) 271.
 determinations of bone and carcasses, (47) N.C. 575.
 diet and handling after vaccination, (47) 86.
 dipping plants, (43) U.S.D.A. 688.
 diseases of, (45) Wis. 285.
 diseases of the skin, (48) 171.
 distribution in South America, (46) 269.
 dried buttermilk for, (44) 674.
 dried yeast for, (44) 867.
 Duroc-Jersey, history, (43) 71.
 edible tissues, vitamin B in, (49) U.S.D.A. 63.
 effect of—
 acids in rations, (41) 273; (42) 266; (47) Iowa 375.
 alkalis in rations, (47) Iowa 375.
 beet molasses, (43) 180.
 excessive protein feeding, (42) Minn. 871.
 mineral supplements on, (45) Ohio 571.
 prolonged maintenance on subsequent growth, (49) 872.
 protein and mineral feeds, (49) Okla. 468.
 red buckeye, Ala.Col. (44) 778; (47) 785.
 vegetable diet, (41) 369.
 ventilation and light, (50) 266.
 elevator screenings for, (43) Can. 868.
 evolution of, (48) 171.
 fall v. spring litters, (50) 777.
 fasting, metabolism, (48) 475.
 fattening experiments, (49) Wyo. 470.
 fattening, individuality as factor, (47) Calif. 671.
 fattening on pasture and in pen, (49) 372.
 feed, cooperative buying, (43) 673.
 feed cost, (50) Can. 868.
 feed requirements, (50) 673, 777.
 feed requirements and costs, (49) Can. 68.
 feeder, regulations for handling, (42) 877.
 feeding, (48) 171, 475, 767.
 feeding—
 and care, (47) N.Dak. 670; (49) 297.
 at weaning time, (48) Mo. 665.
 by method of equivalent feeds, (50) 471.

Pigs—Continued.

feeding—continued.

experiments, (41) Kans. 73, N.J. 73, Ky. 74, Del. 177, Iowa 272, Ohio 272, Fla. 568, 569, Can. 569, Mo. 674, 675, 772; (42) Guam 64, Mont. 66, Mont. 67, U.S.D.A. 370, U.S.D.A. 373, Wis. 373, Kans. 374 Ala.Col. 870, Calif. 870, Minn. 871; (43) Okla. 70, 71, Ky. 373, N.C. 465, U.S.D.A. 465, Pa. 572, 573, Nebr. 673, Ariz. 772, Mo. 772, Can. 773, 774; (44) Ohio 177, Wis. 268, Del. 366, Mont. 367, N.J. 367, Minn. 368, Ohio 471, Ariz. 571, Nebr. 672, S.Dak. 673, U.S.D.A. 770, Ohio 772, Ala.Col. 773; (45) Guam 70, Nebr. 171, N.Dak. 270, Wash. 270, Wis. 270, 373, 377, 472, 474, Kans. 575, Ohio 674, Mich. 875; (46) 271, Iowa 363, Mo. 363, Mont. 364, N.Mex. 365, Tex. 365, Mich. 478, U.S.D.A. 531, Calif. 576, Guam 763, U.S. D.A. 767; (47) 75, 76, U.S. D.A. 171, Wyo. 171, 278, Wis. 468, Pa. 474, Tex. 474, Calif. 573, Wash.Col. 575, 671, Iowa 777, Nebr. 777, Okla. 868, S.C. 868; (48) Wash.Col. 71, 169, Ky. 171, 271, Minn. 372, N.J. 372, 472, 475, Calif. 571, S.C. 665; (49) 68, 168, Mont. 170, Wash.Col. 270, Pa. 271, Ohio 370, Miss. 469, Tex. 469, Ind. 571, Ky. 571, Oreg. 572, Wis. 672, Iowa 772, Idaho 774, Iowa 774, Nebr. 775, N.C. 775, U.S. D.A. 872, Fla. 873; (50) Kans. 67, Miss. 68, Tex. 70, Minn. 169, Mont. 171, Ohio 171, 173, Wyo. 371, 372, Pa. 469, Can. 470, 471, S.C. 672, Can. 776, 870.

feed unit concept, (45) 373.

fundamental principles, (50) 575.

indoor v. outdoor, (50) 371.

nutritional factors, (47) 278.

on pasture, (50) Ill. 673.

on sugar plantation, (48) 370.

with barley variously prepared, (43) Okla. 70.

feeds and feeding, (48) 475.

fiber in rations for, (47) 75.

finishing, (42) Oreg. 267; (47) Idaho 776; (49) Oreg. 373.

following steers, (41) Ind. 69.

forage crops for, (45) 271; (48) 767.

garbage for, (43) Okla. 70, Ky. 374; (44) U.S.D.A. 73.

garbage v. rolled barley for, (44) Ariz. 571.

Gascon, history and description, (47) 576.

Pigs—Continued.

glands, hemicellulose in, (46) 69.

Gloucestershire Old Spots, history, (47) 377.

grain sorghums for, (41) 367.

grain substitutes for, (41) Mich. 74.

growth and development, effect of prolonged maintenance, (48) 398.

growth curves, (50) Mo. 467.

growth, effect of protein intake, (48) Del. 665.

growth estimation, (43) 371.

hairless, (41) 474; (42) 878; (44) Minn. 377.

hairless, prevention, (45) N.Dak. 285.

hairless, relation to iodine, (47) 278.

heat production, (45) 490.

hogging down corn, (43) U.S.D.A. 466; (45) S.Dak. 474.

hogging down corn and peas, (41) U.S.D.A. 72.

hogging down corn and soy beans, (43) Ky. 374; (45) Mo. 271; (46) Mo. 364; (48) Ky. 171.

hogging down experiments, (46) Ky. 874.

hogging down peas, Idaho (45) 271; (46) 171.

hogging down rye, (41) Ohio 569.

individual variation in economy of gain, (41) 772; (43) 572.

industry in Hawaii, (49) Hawaii 572.

inheritance in, (46) 268, 766; (49) Pa. 269; (50) 128.

inside v. outside feeding methods, (49) Can. 68.

internal parasites of, (45) 887.

intestinal worms in, (43) 384.

iron deficiency in diet, (50) 172.

judging, (44) 494.

judging, treatise, (43) 697.

kidney worm in, (48) 679.

Large White, raising, (48) 74.

malnutrition of, potassium iodid in, (42) 679.

marketing, (41) N.C. 695; (47) 75; (48) 476.

metabolic and energy value, (48) 271.

mineral metabolism, (44) Ohio 175.

mineral requirements, (41) Kans. 73; (48) 171.

minerals for, (41) Ohio 178; (46) Iowa 73; (47) 776; (48) 398.

nitrogen metabolism, (42) 265; (44) 174.

nutritional experiments, (49) Ill. 368.

of southern Albania, physical characteristics, (43) 173.

on forage, amount of grain for, (46) Ohio 368.

orphan, raising, Iowa (48) 572; (50) 172.

parasites and diseases, (49) Hawaii 573.

parasites of, (47) 483, 588.

Pigs—Continued.

- pasturing experiments, (41) U.S.D.A. 72, Ohio 178; (42) U.S.D.A. 373, Ala.Col. 870; (43) U.S.D.A. 376, N.C. 465, U.S.D.A. 466, La. 673, 773; (46) Iowa 363, Mont. 364, U.S.D.A. 531, U.S.D.A. 767, U.S.D.A. 874; (48) 73.
- pasturing on alfalfa, (48) U.S.D.A. 271.
- pasturing on dry land crops, (49) U.S.D.A. 371.
- peanut-fed, finishing, (41) Ala.Col. 369.
- peanut-fed, hardening, (42) Tex. 169.
- peanut-fed, improving, (44) Ala.Col. 773.
- peanuts for, (41) Fla. 568.
- potatoes for, (41) Me. 142; (50) 574.
- production and marketing, (49) U.S. D.A. 373.
- production, survey, (47) U.S.D.A. 493.
- project study outlines, (44) 596.
- protein supplements for, (49) Mich. 469.
- purebred v. crossbred, (50) Can. 470.
- raising, (43) Wash. 798.
- raising—
- crop rotations for, (43) Ohio 333.
 - decline in England, (45) 377.
 - equipment for, (46) Iowa 386.
 - handbook, (42) 68, 268, 561.
 - in Australia, (48) 572.
 - in Brazil, (43) 72.
 - in China, (43) 171, 673; (46) 573.
 - in England, (47) 866.
 - in Georgia, (45) 270.
 - in Indiana, (47) 76.
 - in Kansas, treatise, (43) 72.
 - in South Australia, (47) 671.
 - instructions for boys and girls, (49) 195.
 - manual, (50) 869.
 - sanitary measures, (44) 184.
 - suggestions for club members, (50) 496.
- rickets and growth in, (48) 73.
- rough rice for, (45) La. 68.
- self-feeders for, (41) N.J. 73, 488, 569, Mo. 674; (43) 71; (45) Can. 875; (50) Tex. 71, 272.
- self-feeders for, design, (43) 485; (48) Iowa 767; (49) Iowa 572.
- self-feeders for, kind and amount of feeds, (49) 169.
- self-feeding v. hand-feeding, (44) N.J. 367; (47) Ohio 376, Ark. 776; (49) Pa. 271.
- shipment in crates, (42) 877.
- size, sex, and weight per litter, (49) Ky. 573.
- skim milk for, (41) Mich. 74.
- skim milk powder for, value, (46) 874.

Pigs—Continued.

- skim milk substitutes for, (45) Can. 875.
- soy bean meal for, (43) Ohio 377.
- suckling, feeding experiments, (49) Can. 67.
- surface area, determination, (50) 268.
- survey of farms in New Jersey, (44) N.J. 368.
- sweet potatoes v. cassava meal for, (43) 71.
- textbook, (47) 195.
- Tornillo and Pinto beans for, (43) N.Mex. 377.
- treatise, (44) 571.
- type tests, (49) 775.
- types, Iowa (41) 273; (47) 779.
- velvet bean meal for, (44) Mass. 671.
- vetch seed for, (43) 373.
- vitamin A requirement, (47) 169.
- vitamin-rich rations for, effects, (46) Iowa 362.
- wallows for, plans, (43) U.S.D.A. 688.
- weights, (47) 279.
- winter housing, (50) Can. 370.
- worm infested, value of medicinal mixtures, (43) 467.
- Yorkshires v. Berkshires, (49) Can. 68.
- young, immunizing, (41) 86; (43) 683.
- young, losses, cause, (50) 878.
- zinc in muscle tissue, (47) 564.
- Pigweed—
- seed, feeding value, (41) Can. 569.
 - white rust, notes, (44) 48.
- Piima or Fili, rosy milk organism from, (49) 678.
- Pikas, North American, descriptions, (41) 547.
- Pile-set gauges, data, (50) 88.
- Piles in clay, experiments, (50) 86.
- Piles, sheet, wood, solid v. laminated, (43) 590.
- Pileworm, European, summary, (47) N.J. 251.
- Pilgeriella, studies, (45) 746.
- Pili nut oil, composition, (50) 309.
- Pilocarpin, effect on deficiency disease in pigeons. (49) 769.
- Pimento fungus disease, (43) 151.
- Pimpla—
- instigator, notes, (48) 158.
 - spp., parasitism by, (44) 167.
- Pine—see also Pinus.
- as affected by nitrification of soil, (41) 125.
 - as source of fiber and pulp, (43) 828.
 - bacterial tumors, studies, (43) 552.
 - bark aphid, natural control, (50) 844.
 - beams, load tests for shear, (41) 584.
 - beetle, black, notes, (46) 558.
 - beetle, southern, (44) U.S.D.A. 855.
 - beetle, western, (44) Oreg. 166.
 - Bishop, notes, (46) 644.

Pine—Continued.

- blister rust, *see* White pine blister rust.
- borer, ribbed, studies, (43) N.Y.Cornell 855.
- bravo, wood structure of, (42) 739.
- bull, culture experiments, (41) Nebr. 652.
- bull, for Kansas, (41) Kans. 46.
- cone rusts, cronartial stage, (50) 753.
- cones, insect injurious to, (42) 158.
- diseases, (47) 44.
- diseases in Switzerland, (42) 50.
- extensive drying out, causes, (48) 352.
- for wood-block pavement, (41) 790.
- forests, brush disposal, (41) 839.
- forests of Ontario, planting plan, (46) 541.
- forests of South Australia, development, (47) 837.
- forests, regeneration, (41) 344.
- fuel value, (48) 783.
- growth from longitudinal section of trunk, (48) 826.
- growth rate and rainfall, correlation, (47) 836.
- injury from sawfly, (45) 160.
- intertillage experiments, (42) Minn. 839.
- jack, methoxyl in, (50) 206.
- jack, root habit, (41) 634.
- jack, studies, (43) U.S.D.A. 443.
- Jeffrey, hand-pollination experiments, (42) 241.
- leaf miner, notes, (50) 151.
- leaf scale, notes, (47) Conn.State 156.
- loblolly, range, (47) 41.
- loblolly, recovery and growth after suppression, (50) 444.
- lodgepole, needle miner, life history, (45) 255.
- longleaf—
 - effects of turpentining, (42) 241; (49) 238.
 - growth, uses, and protection, (48) U.S.D.A. 141.
 - structure of wood and bark, (47) U.S.D.A. 645.
 - wood analysis, (42) 7.
- Macedonian, description, (45) 141.
- maritime, disease of, (43) 755.
- methods of chipping, (47) U.S.D.A. 645.
- Monterey, stem analysis and elongation of shoots, (45) 334.
- native, (50) S.C. 647.
- needle necrosis, (42) 50.
- needle scale, notes, (49) 50.
- new hybrid, (48) 448.
- new yield table for, (45) 645.
- Norway, current growth in, (50) 544.
- Norway, cutting methods, (48) 642.
- nuts, nutritive value of proteins, (44) 461.
- nuts, vitamin content, (44) 461.
- oil and pine distillate product emulsions, (46) U.S.D.A. 178.

Pine—Continued.

- Parana, lumber industry in Brazil, (50) 40.
- plantation, fertilizer experiments, (43) 24.
- plantation, Scotch, in Sweden, source of seed, (50) 837.
- pollen distribution, (41) 46.
- red rot, (45) 654.
- reproduction and high lead logging, (50) 646.
- resin, usufruct of, (43) 241.
- rust, control, (43) 755.
- rust in Sweden, studies, (41) 659.
- rust, life history, (41) 752.
- rust, transmission, (43) 449.
- sawfly, European, parasitism of, (49) 855.
- sawfly, imported, studies, (50) U.S.D.A. 458.
- sawfly, outbreak, (44) 356.
- Scotch—
 - as nurse crop, (49) 743.
 - behavior as affected by source of seed, (48) 140.
 - liming experiments, (47) 241.
 - seed germination, (46) 142.
 - seed production, relation to temperature, (49) 744.
 - seeds, experiments with, (49) 142.
- Scots, growth as affected by locality, (43) 748.
- second-growth slash, effects of turpentining, (49) 238.
- seed, collecting and storing, (45) 838.
- seed oil, analysis, (42) 410.
- seed, position in cone, relation to germination, (47) 731.
- seedlings—
 - lenticel hypertrophy, (44) 650.
 - parasites on, (42) 248.
 - western yellow, frost heaving, (50) 142.
 - western yellow, soil type and root form, (46) 446.
- seeds, germination, (42) Calif. 839.
- shoot beetle, notes, (46) 558.
- shoot moth, European, parasites of, (43) 259.
- shortleaf, growth, (49) 342.
- slash, growth in the South, (42) 349.
- slash, value, (47) U.S.D.A. 442.
- southern, crushing strength, (44) 286.
- southern yellow, handbook, (42) 580; (50) 587.
- species, comparative value, (50) 544.
- species in Southern Hemisphere, (49) 836.
- spinning sawfly, notes, (41) 847.
- spruce graft on, (41) 47.
- sugar, analysis, (43) 506.
- tree, life history from section of trunk, (47) 226.
- tree litter investigations, (47) 551.
- tree looper, method of studying, (44) 754.

Pine—Continued.

- tree procession moth, combating, (44) 757.
- tube moth, life history, (41) 665.
- weevils, notes, (44) 356; (46) 558.
- western soft, uses and stresses, (44) 149.
- western yellow—
 - abnormal growth, (45) 549.
 - analyses, (48) 416.
 - bark beetle attacking, (44) Oreg. 166.
 - importance and distribution, (46) U.S.D.A. 341.
 - mistletoe on, (48) U.S.D.A. 648.
 - natural reproduction, (49) U.S. D.A. 641.
 - rate and nature of decay in, (49) U.S.D.A. 43.
 - seeds, treatment and storage, (48) 448.
 - waste, distillation, (46) U.S.D.A. 312.
 - windfall loss, (43) 841.
- white, *see* White pine.
- witches' brooms, (47) 251.
- yellow—
 - analysis, (43) 506.
 - as affected by lupines, (47) 644.
 - growth studies, (47) 820.
 - limitation of cut, (44) 147.
 - reproduction, (46) 644.
 - susceptibility to fire injury, (50) 544.
- yellow-white, formation, (48) 221.

Pineal—

- body, effect of feeding, (45) 266.
- body, review of literature, (45) 770.
- gland, embryonic development in the ostrich, (46) 573.

Pineapple—

- black rot, notes, (41) 450.
- chlorosis, (44) 242.
- fibers, analyses, (44) Hawaii 71.
- fruit rot, notes, (45) 843.
- fungus, summary, (46) 348.
- industry, insect problems, (47) 655.
- juice, antiscorbutic value, (47) 568.
- juice for jelly and vinegar, (44) Hawaii 16.
- leaves, stomata on, (41) Hawaii 154.
- mealybug, notes, (41) 756.
- pear, notes, (49) Ga. 531.
- rots, popular account, (45) 850.
- Smooth Cayenne, culture, (42) Guam 37.
- waste, dried, feeding value, (49) 169.
- wilt, control, (48) Hawaii 351.

Pineapples—

- as affected by ultra-violet rays, (43) 731.
- breeding experiments, (41) Hawaii 146.
- culture, (44) Hawaii 44; (45) Guam 43, 44; (47) 835.
- culture experiments, (41) 650; (46) Hawaii 643; (48) Hawaii 343.
- culture in Cuba, (45) 140.

Pineapples—Continued.

- culture in Florida, (46) U.S.D.A. 340.
- culture in Mexico, (48) 639.
- fertilizer experiments, (41) Hawaii 148, 837; (44) Hawaii 44; (46) Guam 734; (48) Hawaii 344; (49) Guam 435.
- improvement, (45) 228.
- insects affecting, (49) 448.
- propagation tests, (46) Guam 734.

Pines—

- for windbreaks on sandy soil, (42) Mich. 348.
- hard, distribution and growth, (45) 540.
- in California, matsucoccus on, (42) 649.
- natural infection, distance of spread, (46) 150.
- of South, (45) 745.
- of South Australia, properties, (46) 382.
- reinfection with *Peridermium pini*, (45) 549.

Pink—

- bollworm, *see* Cotton bollworm, pink.
- disease, distribution in Federated Malay States, (50) 251.

Piñon blister rust, notes (41) 351.

Pinus—*see also* Pine and Pines.

- caribea, growth in the South, (42) 349.
- longifolia forests, effect of fires on, (41) 840.
- longifolia, resin-tapping industry in, (50) 40.
- peuce, description, (45) 141.
- pinea, seeds of, analysis, (42) 410.

Pinworms, control, (49) 77.

Pionea forficatis, parasite of, (43) 858.

Piophilis casei, *see* Cheese skipper.

Pipe—

- cast-iron v. wood-stave, (44) 284.
- cement, machine-made, Ariz. (41) 288. 379.
- cement, tests, (44) Ariz. 584.
- concrete, reinforced, design, (50) 86.
- concrete, use in irrigation, (44) U.S.D.A. 783.
- concrete, water flow in, (44) U.S.D.A. 185.
- corrugated-iron, coefficient of roughness, (46) 888.
- for house drainage, (41) 587.
- friction heads in, calculating, (49) 284.
- horizontal, stress coefficients for, (46) 490.
- lines, hydraulics of, treatise, (47) 288.
- perforated, filter underdrains, (44) 783.
- precast lock-joint concrete, manufacture and installation, (48) 287.
- sizes, new charts for calculating, (49) 685.
- spiral riveted steel, water flow through, (48) 486.
- wood-stave, discharge of, (42) 681.
- wood-stave, studies, (42) 481.

Pipes—

- and valves, loss of head in, (50) 483.
- flow of water through, (42) 480.
- gas, cement joints for, (43) 482.
- hot water, estimating coil sizes, (42) 590.

Pipette—

- and drop methods of measuring sera, (41) 203.
- for lactose determination in milk, (50) 714.

Mohr, note on use, (48) 411.

Pipistrellus subflavus in Wisconsin, (42) 748.

Pipunculus annulifemur n.sp., notes, (48) 552.

Pipunculus spp., parasitism by, (44) 654.

Piricularia oryzae, notes, (41) 749, 841; (42) 145, 741; (43) 444; (45) 48, 650; (46) 448.

Piocydonia danieli, stability and heredity, (43) 818.

Piroplasma—

- argentinum, notes, (45) 883.
- bigeminum, longevity, (44) 27.
- caballi, studies, (42) 178; (43) 83.
- caballi, transmission by ticks, (42) 382.
- mutans, morphology, (45) 886.
- spp., notes, (43) 77, 82, 883.
- tarandi rhangferis, notes, (46) 685.

Piroplasmosis, bovine—*see also* Texas fever. in Great Britain, (46) 484.

Piroplasmosis—

- canine, (48) 182, 486.
- canine, in France, (43) 83; (45) 183.
- canine, transmission in Tunis, (43) 84.
- diagnosis, method, (44) 278.
- equine, in Italy, (48) 182.
- equine, studies, (42) 178, 382.
- in Indo-China, (46) 181; (48) 676.
- in Morocco, (49) 181.
- notes, (48) 579.
- of cattle in Switzerland, (41) 286.
- of horses, (43) 83.
- of reindeer, (46) 685.
- summary, (46) 580.
- transmission, (48) 279.

Piroplasms—

- anaplastic forms, (41) 875.
- classification, (43) 883.
- method of staining, (44) 278.
- of bovines, studies, (47) 883.

Piostroma tetrapsecadiorium, notes, (45) 653.

Pirquet feeding system—

- critique, (49) 856.
- essential features, (50) 360.

Pisciculture in France, (42) 396.

Pisé de terre—

- construction, (44) 787; (49) 586; (50) 88.
- farm buildings, construction, (46) 386; (48) 288.
- use, (47) 391.
- value for farm cottages, (44) 689.

Pissodes—

- dubius, notes, (42) 748.
- spp., notes, (44) 356.
- strobi, *see* White pine weevil.
- terminalis n.sp., description, (44) 658.

Pistache collar disease, control, (43) 243.

Pistache trees, value in Arizona, (40) U.S. D.A. 138.

Pistacia species, introduction as shade tree, (45) Ariz. 439.

Pita floja fiber, commercial status, (50) 829.

Pitnus huesanus n.sp., notes, (41) 63.

Pits, construction for manure conservation, (43) 423.

Pituitary—

- body, changes in deficiency disease, (43) 664.
- body, relation to growth, (41) 270.
- feeding, effect on egg production, (44) 368; (50) 275.
- feeding, effect on growth and gonad development, (50) 366.
- feeding of white rats and mice, effects, (41) 767, 768; (43) 67.
- gland and thyroid, correlation, (43) 770.
- gland substance, feeding value, (49) Can. 70.

Pituitrin—

- content of tissues as affected by thyroid feeding, (44) 670.
- effect on carbohydrate metabolism, (42) 557.
- effect on milk secretion, (41) 79.

Pityogenes chalcographus, identification, (47) 258.

Pityogenes meridianus n.sp., description, (46) Miss. 462.

Pityokteines sparsus, notes, (42) 748.

Pityophthorus n.spp., descriptions, (46) Miss. 462.

Pityophthorus spp., notes, (42) 158.

Placenta as gland of internal secretion, (41) 173.

Placentas, maternal, evolution after ovarian grafts, (47) 573.

Placosphaeria nicotianae n.sp., notes, (50) 248.

Plaesus javanus, notes, (43) 52.

Plagionotus speciosus, notes, (50) Conn.State 50.

Plague epidemiology, rat fleas as factor, (47) 252.

Plague, Pahvent Valley, studies, (42) 476.

Plaguelike organisms in wild rats, (44) 183.

Plane table manual, (48) 782.

Plane tree disease—

- as affected by dry weather, (43) 652.
- in Victoria, (41) 353.
- synonymy and control, (44) 849.

Plane trees, parasites of, (43) 754.

Plant—

- analyses and fertilizer requirements of soil, (43) 518.

Plant—Continued.

- analysis and fertilization, (44) 815.
- associations of Idaho forests, (48) 641.
- associations on sand dunes, (41) 633.
- biology, elements, treatise, (50) 626.
- biology, treatise, (48) 192.
- breeder's envelope, description, (42) 229.
- breeding, (48) Mich. 224.
- breeding—
 - at Gross Enzersdorf, (50) 28.
 - at Proskau, (48) 442.
 - correlation coefficient, demonstrat-
ing, (41) 697.
 - experiments—*see also special*
crops.
 - experiments, (41) Mich. 636, (44)
P.R. 236, Calif. 725.
 - fundamentals, treatise, (48) 829.
 - handbook, (45) 35; (46) 829;
(49) 735.
 - in Ontario, (43) 235.
 - in Porto Rico, (42) 30.
 - in Scotland, (48) 434.
 - in Wales, (45) 523.
 - Institute of University of Cam-
bridge, (49) 493.
 - labor-saving devices in, (44) 228.
 - methods, (42) 631; (43) 535;
(45) Mich. 223, 822.
 - segregation of disease-susceptibil-
ity factors, (41) 747.
 - serological studies, (45) 335.
 - technique, (41) Minn. 730.
 - tools and technique, (47) 221.
 - treatise, (45) 734; (47) 823.
 - work in Scotland, (41) 636.
- buds, development and arrangement,
(42) 130.
- cancers, studies, (43) 242; (44) 248;
(46) 49; (48) 747, 843; (50) 745.
- cell—
 - cytoplasm, elements in, (50) 125.
 - division hormones in, (49) 219.
 - division, periodicity of elongation,
(45) 527, 528.
 - fission frequency, variations in,
(45) 527.
 - membranes, behavior toward iron
salts, (48) 827.
 - wall, biochemistry and physiology,
(44) 821.
 - walls, semipermeability in, (49)
218.
- cells—
 - abnormalities, (43) 732.
 - action of pressure on, (50) 23.
 - analysis, (45) 732.
 - capillary processes in, (46) 432.
 - chemistry, treatise, (50) 427.
 - chondriome in, (44) 629, 822, 823.
 - concentrations of electrolytes in,
(43) 633.
 - effect of saponin on, (48) 126.
 - epidermal, plasmolysis, (41) 818.

Plant—Continued.

- cells—continued.
 - fibrous protoplasmic structures
in, (42) 228.
 - fluorescence of chlorophyll, (45)
628.
 - heliotropism in, (44) 823.
 - hereditary substances in, (44) 726.
 - H-ion concentration, (49) 520.
 - lipoids in, (43) 524.
 - liquid content, (44) 630.
 - microsomes in, (50) 23.
 - mitochondria in, (46) 29, 824.
 - nucleus as center of oxidation,
(41) 221.
 - osmotic conditions in, (48) 126.
 - osmotic properties at low tempera-
tures, (45) 219.
 - penetration of cations in, (47)
424.
 - permeability, (41) 329.
 - relation to size characters, (41)
224.
 - rhythmic precipitation phenomena
in, (49) 218.
 - structure, (47) 127, 627; (50)
427.
 - structure and metabolism, (45)
30.
 - symbiotic complex of, (44) 821.
 - vital coloration, (44) 428.
 - vitamin content, relation to respi-
ration, (42) 759.
- chamber, constant humidity in, (47)
823.
- chlorosis, relation to lime, (44) 243.
- chondriomes, (45) 30.
- chondriosomes, review of investigations,
(41) 727.
- chromosomes—*see also Chromosomes.*
behavior in fertilization, (41) 431.
- colloids, action in growth, (41) 25,
26, 27, 132.
- colloids, studies, (42) 727; (43) 524.
- color, modification, (46) 224.
- colors, characters and behavior, (46)
223.
- communities of a sand ridge region,
development, (49) 629.
- competition, factors affecting, (44)
630.
- constituents, analysis, (44) 9.
- development and soil reaction, (50)
532.
- development in relation to weather,
(41) 222.
- disease—
 - immunity and its inheritance, (41)
656.
 - information service in New York,
(41) 245, 248.
 - inspection in France, (41) 654.
 - inspection in Jamaica, (43) 48.
 - laws in British Empire, (49) 540.
 - legislation in Tropics, (42) 599.

Plant—Continued.

disease—continued.

- organisms in soil, disinfection, (41) 49.
- organisms in soil, notes, (41) 655.
- research in Great Britain, (41) 399.
- resistance, biochemistry of, (44) Minn. 746.
- resistance, soil factors in, (45) 841.
- survey, (42) Wis. 350, S.C. 447; (43) Okla. 44; (45) Wash. 243; (46) S.C. 741; (49) Wash.Col. 242.

disease survey—

- in China, (45) 647.
- in India, (42) 146.
- in New York, (41) 245.
- in Ontario, (46) 844.

diseases—see also Fungi and different host plants.

- and immunity, (47) 645, 750; (49) 442.
- and injuries, (44) Conn.State 149.
- and pests, (43) 750; (45) 746; (46) 448; (47) 348; (50) Calif. 838.

diseases and pests—

- handbook, (46) Calif. 238.
- in Dutch East Indies, (41) 544; (49) 144; (50) 548.
- in England and Wales, (48) 740.
- in St. Lucia, control, (42) 741.

diseases—

- bacterial, treatise, (48) 142.
- biochemistry, (46) 553.
- biochemistry of resistance to, Minn. (42) 841; (50) 146.
- control, (43) 842; (45) 44, Colo. 240, Wis. 244; (47) 45, 242.
- control, application of genetics, (42) 144.
- control in China, (47) 254.
- control, progress in, (41) 450.
- development in dry weather, (43) 652.
- diagnosis, (41) 840.
- dissemination, (41) 840.

diseases, dissemination by—

- insects, (42) 748; (43) 450, 842.
- rain, (41) S.C. 50.
- seed, (42) 447; (50) 745.
- wind, (42) 215.

diseases—

- effect of soil and fertilization, (43) 513.
- epidemics of, (48) Mass. 643.
- fungus, recent literature on, (47) 43.
- greenhouse, (45) 851.
- greenhouse, relation to water supply, (45) 841.
- immunity, treatise, (45) 840.
- importation, (41) 158.
- in Barbados, (45) 541.

Plant—Continued.

diseases—continued.

- in Bermuda, (45) 47.
- in Bombay Presidency, (41) 655.
- in British Columbia, (42) 739, 740.
- in British Guiana, (41) 841.
- in Canada, (44) 48; (49) 442.
- in Ceylon, (41) 745; (42) 741.
- in Cuba, (41) 847.
- in Dutch East Indies, (43) 45; (44) 351; (46) 343.
- in England, (46) 741.
- in England and Wales, (43) 45, 652; (49) 645.
- in France, (41) 49; (46) 44; (50) 345.
- in Gembloux, (49) 540.
- in Great Britain, (41) 49; (42) 46.
- in India, (42) 145, 146; (46) 742; (47) 43.
- in Indiana, (43) 243; (49) 144.
- in Indo-China, (46) 741.
- in Iowa, (41) Iowa 245.
- in Italy, (43) 346; (44) 48; (47) 148, 838.
- in Mauritius, (42) 843.
- in Michigan, (41) 841.
- in Morocco, (46) 647.
- in Netherlands, (44) 642; (46) 741; (49) 242.
- in New Jersey, N.J. (41) 48; (45) 50.
- in Norway, (49) 645.
- in Ohio, (44) 48.
- in Ontario, (42) 541; (46) 43.
- in Pennsylvania, (42) 447.
- in Philippines, (41) 841; (42) 242; (46) 43, 845.
- in Poland, (46) 742.
- in Porto Rico, (43) 544.
- in Queensland, (42) 741.
- in Rhine Province, (44) 150.
- in small gardens, control, (46) 742.
- in South Africa, (41) 450.
- in South Dakota, (47) 848.
- in Switzerland, (49) 144.
- in Union of South Africa, (47) 839.
- in West Indies, (45) 550.
- in western Australia, (44) 48.
- in western Quebec, (50) 345.
- insect-borne, (44) 159.
- insects as carriers, (47) 552.
- light treatment for, (50) 345.
- list, (44) N.J. 342.
- meteorological relations, (47) 43.
- names, recent changes, (48) 345.
- new, (43) 544.
- new, in Philippines, (47) 348.
- nomenclature, standardizing, (47) 645.
- nonparasitic, treatise, (46) 843.
- notes, (41) Hawaii 153; (43) N.Y.State 544; (50) S.C. 647.
- perpetuation, (43) 242.
- prevention, (49) 442.

Plant—Continued.

diseases—continued.

- quarantine, (41) 443, 654, 746.
- recent literature on, (42) 541.
- relation to climate, (41) 841.
- relation to soil reaction, (43) 513.
- relation to soil temperature, (49) 240.
- relation to temperature, (50) 41.
- relation to weather, (44) Mass. 445.
- research at Rome, (47) 148.
- research in Bombay, (50) 243.
- resistant varieties, breeding, (45) 49.
- resistant varieties, selection and production, (47) 840.
- rôle of bacteria in, (43) 444.
- seed-borne, (47) 840; (48) 46.
- textbook, (45) 540.
- treatise, (44) 642; (46) 238.

distribution—

- around salt marshes, (45) 123.
- as affected by solar radiation, (43) 731.
- in District of Columbia, (42) 223.
- in Santa Lucia Mountains, (41) 220.
- in the far North, (41) 634.
- in undrained depressions near Sacramento, (43) 224.
- relation to sap concentration, (41) 220.
- relation to soil acidity, (44) 19; (46) 432, 525; (47) 222, 619; (48) 515; (49) 618; (50) 420.

ecology—

- and its relation to agriculture, (41) 820.
- of Kansas sand hills, (43) 731.
- studies, (41) 327.
- embryos, nutrition, (41) 726.
- enzymes, action, (44) 222.
- enzymes, oxidizing, (41) 203.
- enzymes, reactions, Del. (41) 132; (44) 424.
- excretions, (46) 224.
- excretions, physiology and biology, (44) 630.
- food adsorption by colloidal silica, (49) 17.
- food constituents as affected by irrigation and drainage, (49) N.Mex. 886.
- food, mineral, availability, (50) 21.
- foods, (46) 224.
- formations—
 - at different altitudes, (43) 149.
 - climax, studies, (41) 327, 429, 634; (49) 30.
- galls, origin and structure, (48) 740.
- galls, Philippine, studies, (42) 730.
- genera and species, field and garden study, (41) 330.
- genesis, studies, (41) 347.
- glucosids, physiological rôle, (42) 226.
- growth, (47) Minn. 348.

Plant—Continued.

growth—

- abnormal, in *Gossypium*, (41) 429.
- analysis, (45) 525, 819.
- and climate, relation, (50) 807.
- and composition as affected by light, (49) 739.
- and soil conditions, treatise, (46) 809.
- apparatus for measuring, (43) 32.
- as index of climatic conditions, (47) 412, 413.
- chemistry, progress in, (41) 201.
- compound-interest law, (43) 29.
- curve, (45) 627.
- curves, interpretation, (48) 726.
- curvilinear, (50) 127.
- growth, effect of—
 - aeration on roots, (43) 327.
 - arsenic, (48) 326.
 - artificial light, (41) 885.
 - Azotobacter*-inoculated soil, (47) 21.
 - bacterized peat, (43) 514.
 - carbon dioxide, (43) 321, 510; (44) 618, 725; (45) 218.
 - chlorids, (42) 335.
 - chromium and manganese, (42) 525.
 - cold in stimulating, (44) 424; (46) 225.
 - colored light, (46) 325.
 - crude petroleum, (42) 435.
 - defoliation, (47) 749.
 - dicyandiamid, (45) 330; (46) 625.
 - electric light, (47) 327.
 - electricity, (46) Ky. 830.
 - formalin in conserved liquid manure, (46) 518.
 - Fusarium nivale*, (44) 642.
 - length of day, (42) 818; (45) U.S.D.A. 730; (47) 225.
 - light, (43) 431.
 - lime-magnesia ratio, (45) 425.
 - meteorological phenomena, (43) 207.
 - nucleic acid, (49) 815.
 - peat, (47) 523.
 - pH of nutrient solution, (44) 28; (46) N.J. 525; (50) 627.
 - potassium, (44) N.Y. Cornell 818; (45) N.H. 337.
 - potassium radioactivity, (45) 428.
 - salts and alkalinity, (48) Calif. 524.
 - seed weight, (50) 821.
 - silica and silicates, (47) Ohio 423; (48) 722.
 - smoke, (44) 430.
 - soil reaction, (43) 513.
 - sunlight, (43) 509; (48) U.S.D.A. 113.
 - temperature, (50) 821.
 - the moon, (49) 115.
 - thyroid constituents, (43) 225.
 - wind, (46) 827.

Plant—Continued.

growth, effect on—

- oxidation in soil, (47) 212.
- oxidizing flora of soil, (46) N.J. 526.
- sedimentation period, (46) 517.
- soil acids, (47) 723.
- water-soluble material in soils, (44) N.Y.State 320.

growth—

- efficiency index, significance, (46) 523.
- factors and rate, (45) 427.
- factors, law governing, (50) 532.
- function of calcium in, (46) 433.
- high temperature record, (45) 526, 731.
- in artificial light, (48) 26; (50) Minn. 126.
- in heated soils, (41) 215; (42) Wis. 350.
- in media poor in oxygen, (50) 327.
- in sand and solution cultures, comparison, (50) 813.
- in soda-containing soils, (42) 436.
- in sterilized soil, (42) 25; (43) 422.
- limiting factor theory, (41) 429.
- measurement in terms of volume, (45) 333.
- mechanics of, (45) 333.
- new high-temperature record for, (48) 824.
- periods, (45) 428.
- process, dynamics, (44) Calif. 726.
- quantitative analysis, methods, (46) 523.
- rapid, and wilting in *Cestrum*, (41) 429.
- rate in shoots, (45) 627.
- rate, nature of, (46) 127.
- rates, (41) 525.
- regulation, experiments, (44) 519.
- relation of salt proportions to, (44) N.J. 325.
- relation to climatic control, (43) 431.
- relation to nitrifying power of soils, (47) 215.
- relation to rest, (44) 132.
- rôle of colloid reactions, (42) 433.
- studies, (41) 25, 26, 132; (43) 428, 431; (48) 726.
- studies with crescograph, (41) 724; (45) 627.
- growth-promoting substances in composts, (43) 815.
- hygiene, illustrative material, (43) 635.
- hypocotyls, bud formation of, (41) 818.
- improvement by bud selection, (45) 741.
- improvement, treatise, (48) 836.
- indicators, (49) 128.
- indicators in ecology studies, (41) 327.
- indicators of soil types, (47) 519.
- indicators, treatise, (45) 525.
- inspection, (42) 152; (45) Mo. 44.

Plant—Continued.

- introduction in Australia, (41) 29.
- introduction in the Americas, (41) 635.
- introduction work, (45) Ariz. 439.
- invasions of New Zealand, (45) 222.
- juices, acidity, (47) 517.
- juices, determination of acidity, (42) 505.
- juices in contact with soil lime, acidity, (49) 121.
- juices reaction, studies, (42) 727; (45) 427.
- lice—*see also* Aphids and specific kinds.
 - affecting truck crops, (49) Pa. 251.
 - and light exposure, (50) 845.
 - family name, (45) 757.
 - in apple orchards, (46) N.Y.State 351.
 - jumping, of Palaeotropics, (43) 450.
 - killed by nicotin gas, laboratory study, (50) 254.
 - notes, N.J. (42) 849; (44) 349; (48) 353.
 - transmission of mosaic by, (42) 250.
- life and growth, treatise, (49) 836.
- life in New Zealand, treatise, (46) 222.
- life zones, rôle of sedges in, (43) 129.
- metabolism, (47) Minn. 348.
- metabolism and growth, studies, (50) Minn. 125.
- metabolism, carbon-nitrogen ratio, (43) 430.
- movement, studies, (41) 724.
- movement, treatise, (46) 528.
- movements, developmental, (46) 224.
- movements, irritable, (42) 333.
- nutrients—
 - adsorption, (50) 16.
 - availability, (50) 17.
 - continuous renewal, (47) 127.
 - exosmosis to infection drop, (48) 843.
 - in soil, effect of adsorption on, estimation, (50) 203.
 - In soil, estimation, (50) 118.
 - loss by leaching, effect of liming, (48) 220.
 - productive value, (47) 24.
 - removal by drainage, (47) Ky 122.
 - sources, (50) 322.
- nutrition—
 - an electrical phenomenon, (49) 519.
 - exchangeable potassium for, (48) 214.
 - in calcareous soils, (46) 321.
 - physiology of, (41) 501.
 - relation to soil moisture, (45) 214.
 - relation to sulphur composts, (45) 25.
 - studies, Calif. (47) 625; (48) 522, 523.

Plant—Continued.

- oil, therapeutic value, (46) 568.
- parts, orientation, studies, (43) 730.
- pathogen and host, differential staining, (43) 444.
- pathology—
 - and chemotherapy, (49) 839.
 - and entomology in modern forestry, (47) 837.
 - check list of station publications, (47) 307, U.S.D.A. 347.
 - development, (46) 739.
 - in British Empire, (44) 48.
 - in Japan, sketch, (42) 242.
 - present status in agriculture, (49) 240.
 - progress in, (41) 450.
- pest control legislation in Florida, (46) 457.
- pest law, inspection work under, (46) 152.
- pest laws in British Empire, (49) 540.
- pests and parasites, booklet, (50) 545.
- physiology, (42) 626; (44) Calif. 726; (45) Idaho 218.
- physiology—
 - osmosis in, (45) 29.
 - studies, (41) Mich. 630, 818.
 - treatise, (46) 126.
 - Weber's law in, (45) 626.
- pigments, *see* Pigmentation.
- production—
 - course of study, (43) 797; (44) 194.
 - laboratory exercises, (42) 298, 496.
 - quadrats, (46) 27; (49) 29.
 - textbook, (41) 396.
- products as chemical raw material, (50) 608.
- products, chemistry of, (45) 201; (48) 801.
- products, perishable, transportation, (41) 154.
- prophylaxis, measures, (42) 45.
- protection—
 - bibliography, (50) 142.
 - from frost, (44) 811.
 - in Quebec, paper on, (42) 748.
 - organization for, (46) 447.
 - practical, (46) 447.
- protectives, tests, (49) 540.
- proteins v. tankage for pigs, (45) Ohio 675.
- protoplasm, dry, resistance to anesthetics, (44) 28.
- protoplasm, morphological constitution, (47) 627.
- protoplasts, negative osmosis in, (44) 823.
- Quarantine Act, Federal, (42) 355; (45) 454.
- quarantine—
 - importance in Philippines, (45) 140.
 - in Florida, (45) 253.
 - in Japan, (44) 40.

Plant—Continued.

- quarantine—continued.
 - in Porto Rico, (42) 52; (45) 453, 833.
- root cork, ecological significance, (43) 732.
- root diseases, relation to soil temperatures, (42) Wis. 350.
- root forming substances in, (49) 127.
- root systems, physiological processes, (48) Calif. 523.
- roots—*see also* Roots.
 - and stems, inverse orientation in, causes, (50) 128.
 - excretion of toxins from, (45) 821.
 - invertase secretion, (45) 628.
 - modifications by mechanical action, (50) 23.
- sap studies, (50) 524.
- sap, sucrose determination in, (45) 208.
- sections, technique of mounting, (42) 229.
- societies, methods of study, (42) 128.
- societies of Petoskey-Walloon Lake region, (43) 523.
- sources of vitamins B and C, (47) 465.
- stems, function of wood vessels in, (41) 726.
- stems, modifications by mechanical action, (50) 23.
- stems, orientation, (50) 225.
- stocks and scions, relation between, (44) 535.
- structures, synchronism in, (41) 328.
- succession—
 - and distribution in Africa, (43) 326.
 - and soil reaction, (49) 417.
 - in relation to range management, (41) U.S.D.A. 521.
 - topographic relief as factor, (46) 432.
- tissue—
 - dry v. fresh, effect on calcium assimilation, (44) 64; (46) 566.
 - extracts, nitrogen determination in, (49) 309.
 - fluids, properties, (49) 24; (50) Minn. 125.
 - fluids, specific electrical conductivity, relation to freezing point lowering, (44) 324.
 - laticiferous, origin and nature, (49) 29.
 - origin of electrical charges, (47) 424.
 - sieve, function, (44) 645.
 - substance in culture media, effect on bacteria, (47) 425.
- tissues—
 - anaerobic bacteria in, (48) 451.
 - conductivity, (41) 725.
 - effect of arsenious acid, (45) 528.
 - effect of feeding punctures of aphids, (50) Pa. 557.

Plant—Continued.

tissues—continued.

- effect on bacterial nutrition, (50) 184, 879.
- freezing, factors affecting, (44) N.Y.Cornell 821.
- H-ion concentration values, (49) 520.
- infected, rise in temperature, (48) 432.
- infiltration and preparation for microscope, (45) 599.
- injury from capsid bugs, (44) 453.
- inorganic iron in, distribution, (45) 10.
- multinucleate cells in, (44) 427.
- new hormone in, (50) 108, 765.
- nitrites and nitrates in, (44) 504.
- nutritive factors in, (41) 762; (42) 759.
- preserving methods, (49) 9.
- rate of absorption of salts, (44) 425.
- semipermeability in, (43) 225.
- shrinkage in salt solutions, relation to plasmolysis, (44) 630.
- solution and fixation accompanying swelling and drying, (45) 333.
- starch determination in, methods, (48) 805.
- translocation of foods in, (44) 323.
- turgescence, behavior in sugar and toxic solutions, (41) 525.
- vitamin A extraction from, (43) 165.
- vitamin A formation in, (46) 356; (49) 767.
- volatile substances from, effect on spore germination, (49) 240.
- twigs, detached, uptake of water by, (45) 220.

Plantago aristata, notes, (44) Pa. 737.

Plantago maritima, habitats of, (42) 628.

Plantain, heredity in, (44) 517.

Plantain trees, Thielaviopsis disease of, (48) 740.

Plantains—

- as paper-making material, (41) 732.
- insects affecting, (47) 848.
- Thielaviopsis disease on, (44) 342.

Planting dates—

- relation to daily exposure to light, (42) 818.
- temperature influence on, (41) U.S.D.A. 716.

Plants—

- absorption and metabolism, (42) 24.
- absorption of calcium by, (45) 29.
- absorption of nutrients by, (48) Calif. 523.
- acclimatization, (41) 29, 634.
- acidity of roots and tops, (42) 424.
- action of chlorophyllin on, (44) 825.
- adaptation in relation to hardiness, (41) 144.

Plants—Continued.

- adaptation, studies, (41) 328.
- adaptation, theory of, (41) 220.
- aerial fertilization with carbon dioxide, (41) Vt. 833.
- aerial parts, glucose absorption, (41) 818.
- albino, effect of sugar on growth, (44) 223.
- alkaloids in, (46) 324; (47) 31.
- alpine and lowland, difference in chlorophyll content, (44) 132.
- alpine and plains, leaf anatomy, studies, (42) 432.
- alternation of generations, (42) 332.
- aluminum ions in, (44) 222.
- anatomy, relation to myrmecophytism, (48) 256.
- and external medium, exchange between, (44) 630.
- and soil bacteria, symbiotic relation, (47) 213.
- and soils, interrelations, (47) Calif. 210.
- animals injurious to, (43) 152.
- annual—
 - flowering, culture, (45) U.S.D.A. 45.
 - immunity to symbiotic fungi, (45) 28.
 - overwintering of mosaic on, (47) 349.
 - physiological characters, (42) 128.
- anthocyan formation in, (49) 26.
- aquatic, of English lakes, (47) 526.
- aromatic, culture, (41) 339; (42) 43.
- aromatic, of Germany, (41) 743.
- as affected by—
 - aeration, (48) 828.
 - ammonium sulphate, (46) Mass. 21.
 - anthracene, (45) 29.
 - borax, (47) N.H. 423.
 - carbon dioxide, (47) 128, 224, 724, 815.
 - cement dust, (47) 749.
 - centrifugal force, (43) 327; (48) 828.
 - copper, (45) 29.
 - fluorin, (43) 523.
 - gas and smoke, (44) 825.
 - gases, (41) 846; (43) 523; (45) 28, 29, 125, 734; (46) 128.
 - hydrocyanic acid, (44) 223.
 - illuminating gas, (42) 730; (44) 825.
 - iron, (45) 29.
 - lead salts, (50) 221.
 - light, (45) 526.
 - light wave lengths, (44) 824.
 - low temperature, Minn. (47) 348; (50) 125.
 - magnesium, (44) 519.
 - manganese, (47) 820.
 - organic substances, (43) 822; (45) 820.

Plants—Continued.

- as affected by—continued.
 - salts, (47) 812.
 - smelter fumes, (41) 329, 427.
 - smoke, (45) 425, 821.
 - soil dryness, (44) 631.
 - ultra-violet rays, (42) 730.
 - winter of 1916-17, (43) 326.
- as food substitutes in Germany, (43) 204.
- as wild duck food in Nebraska, (43) U.S.D.A. 50.
- ash constituents, (41) 502.
- assimilation—
 - chemical mechanism, (47) 224.
 - in, (42) 335.
 - of carbon dioxid by, (42) 226.
 - of nutrients, (46) 622.
 - specific, (44) 821.
 - theory of, (43) 526.
- barium in, (43) Ky. 327; (46) Colo. 28.
- behavior as affected by calcic and magnesian limes, (47) 624.
- behavior in unventilated chambers, (41) 819.
- behavior of organic substances in, (43) 632; (46) 324.
- betain in, (42) 335.
- biochemical classification, (45) 732.
- biochemistry of, (45) 819.
- biochemistry, textbook, (47) 522; (50) 626.
- biochemistry, treatise, (49) 218.
- blooming dates in Iowa, (42) 38.
- carbohydrate metabolism, (41) 25, 28; (47) Calif. 625.
- carbohydrate production, (45) 336.
- carbohydrate production, biochemistry, (46) 522.
- carbon dioxid fertilization, (49) 216.
- carbon dioxid nutrition, (42) 137; (44) 132, 814; (46) 424; (48) 126.
- chemical system, effect of salts, (50) Calif. 221.
- chemistry of, localization, (42) 433.
- chemistry of, treatise, (47) 9.
- chlorophyll free, vitamin B in, (48) 162.
- chlorophyll in, fate in autumn, (43) 526.
- chlorophyll production in intermittent light, (44) 824.
- classification by cell nuclei, (43) 524.
- classifications, (46) 522.
- collecting, (42) U.S.D.A. 724.
- colonial, breeding, (49) 735.
- colors in, (50) 728.
- composition, relation to silicates, (48) 722.
- condition, effect on fumigation damage, (44) U.S.D.A. 251.
- conducting apparatus, acceleration of development, (50) 225.
- contact stimulation, (41) 222.
- copper determination in, (44) 62.

Plants—Continued.

- copper distribution and movement, (44) 825.
- correlation in, studies, (41) 327.
- cross and self fertilization, relative efficiency, (45) 222.
- cross fertilization in, (44) 429.
- cryptogamic parasites of, (46) 448.
- cultivated, degeneration in, (49) 822.
- cultivated, of Spain, catalogue, (44) 40.
- cultivated, vegetable parasites, (50) 244.
- culture, fundamentals, treatise, (46) 720.
- culture in rooms and greenhouses, (48) 447.
- culture solutions, studies, (42) Calif. 819.
- culture, treatise, (45) 438.
- curvature-producing substances in, (49) 127.
- cyanophoric, in Queensland, (48) 432.
- daily periodicity in, (43) 820.
- declared public nuisances in Mississippi, (42) 249.
- desert, *see* Desert plants.
- dormant, effect of cold, (44) 424.
- double symbiosis in, (46) 722.
- dry gummosis in, (47) 348.
- dune, ash of, (43) 431.
- dwarfing on river shores, (41) 820.
- dye, culture in Nigeria, (43) 637.
- ecesis in swamps, (42) 728.
- ecological basis of organization, (44) 517.
- economic, in Uganda, (45) 140.
- economic, of English Sudan, (45) 538.
- edible, Sturtevant's notes on, (45) N.Y.State 122.
- effect of—
 - ages of parents on dominance of characters in progeny, (49) 222.
 - concentration of nutritive media, (43) 523.
 - concentration of salts, (47) Calif. 620.
 - light on absorption of organic matter, (42) 729.
 - nitrogen on geotropic and phototropic responsiveness, (42) 730.
 - phosphates on α -crotonic acid action, (43) 131.
 - shading, (46) N.H. 138.
 - starch on geotropic and phototropic responsiveness, (42) 728.
 - sterilizing agents, (46) 544.
- Egyptian, experiment work, notes, (44) 499.
- electrical conductivity, (41) 725, 819.
- electro-osmotic phenomena in, (45) 626.
- endemic, of isolated regions, development, (41) 220.
- energy relations, (47) 224.

Plants—Continued.

- epidermal coverings, importance of, (42) 628.
- erectness of, (49) 219.
- essence, culture in France, (44) 45.
- etiolated, cause of stem elongation, (44) 824.
- evolution and genetics in, (44) 631.
- evolution of, (46) 524.
- evolution of, treatise, (44) 218.
- external cell layer, (48) 827.
- fasciation in, studies, (42) 332.
- fat production in, (44) 430.
- feeding power, (48) 25.
- feeding power, criticism, (48) 827.
- fermentation accelerating extracts, (47) 663.
- fermentation of nectar, (43) 730.
- fertility problems, (43) 521.
- fertilization, chromosome behavior in, (41) 431.
- fertilization with pollen of various ages, results, (48) 127.
- fiber, *see* Fiber.
- fibrillar structures, (45) 732.
- floral anatomy at various altitudes, (50) 324.
- flowering—*see also* Plants, ornamental.
 - and fruiting as affected by length of day, (43) 819.
 - culture, (49) Can. 832.
 - dictionary of, (43) 148.
 - inheritance of germinal peculiarities, (45) 335; (46) 27.
 - new, from Guatemala and Honduras, (46) 721.
- food, of citrus black fly, (44) U.S.D.A. 454.
- food producing, American, (42) 432.
- for feeding stuffs in Germany, (43) 170.
- for grazing during drought in India, (48) 371.
- for hedges, (48) Can. 38.
- for Nebraska, list, (43) 240.
- forage value, (48) Calif. 528.
- forcing by electrical stimulus, (42) 38.
- forcing, treatise, (50) 834.
- formaldehyde as a transition stage in, (45) 528.
- forming moors, hydrogen-ion concentrations in, (45) 324.
- freezing-point lowering, studies, (43) 515.
- from Philippine forests, (48) 842.
- frozen, as affected by manner of thawing, (43) 432.
- fumigation with hydrocyanic acid gas, (42) 529.
- gain or loss of electrolytes, (41) 132, 221.
- genetic nature of winter and spring varieties, (46) 632.
- geotropic behavior, theory, (47) 327.
- geotropic response, (42) 728, 730; (44) 823.

Plants—Continued.

- geotropic stimulation, (41) 725; (44) 823.
- germination as affected by *Fusarium nivale*, (44) 642.
- germination, phytochemical studies, (42) 131.
- grafted, migration of principles in, (49) 822.
- grafted, reactions and callus in, (44) 820.
- grafted, rôle of callus in, (45) 28.
- grafting experiments, (48) 127.
- grafting, theory and application, (47) 339.
- green—
 - and fungi, parallels, (42) 433.
 - development of color in darkness, (44) 824.
 - effect on oxidizing flora of soil, (46) N.J. 513.
 - nitrogen fixation by, (43) 430.
 - phospho-organic salts in, (43) 525.
- greenhouse, insects affecting, (48) 153; (50) U.S.D.A. 845.
- growing in the dark, (46) Del. 628.
- grown in salt water, anomalies in, (47) 224; (50) 428.
- grown in salt water, stabilization of characters, (47) 224.
- halophyte, germination and growth, effect of salinity of water, (49) 730.
- hardening, nature of, (43) 643.
- hardiness in, (48) 233, 234.
- hardiness, relation to pentosan content, (46) 443.
- hardiness, relation to water-retaining capacity, (48) 234.
- hardwood cuttings, rooting tests, (45) 638.
- hardy perennial, autumn planting, (42) Ohio 397.
- hardy perennial, treatise, (48) 41.
- heat production, (43) 819.
- heredity and evolution in, treatise, (45) 426.
- high-altitude, nitrogen storage, (41) Wyo. 333.
- high-moor, transpiration in, (42) 629.
- honey, American, (43) 259.
- horticultural, adaptable to the islands, (48) Hawaii 338.
- house, care, (50) Kans. 141.
- house, treatise, (50) 543.
- hybridization, cause of apogamy in, (42) 527.
- hybridization experiments, (43) 535.
- hydrocyanic acid formation in, (46) 630.
- hydrocyanic acid injury to, (46) 641.
- immunity reactions in, (50) 345.
- immunity to their own products, (42) 227.
- importation, rules and regulations, (43) U.S.D.A. 741.

Plants—Continued.

- imports, U.S.D.A. (42) 336; (43) 635; (46) 29; (47) 129, 426; (48) 128, 730; (49) 128, 426, 523; (50) 225, 428.
- imports into India, (45) 657.
- in botanic gardens in British Guiana, (44) 40.
- in new habitats, studies, (46) 26.
- in wind, water utilization by, (45) 428.
- indicator, detection of overgrazing by, (47) 540.
- indoor, culture and care, (42) 533.
- inheritance in, (47) 821.
- inheritance of susceptibility to parasites, (43) 841.
- injury and recovery, (46) 128; (47) 626; (48) 125, 126.
- injury from coal tar emanations, (47) 749.
- injury from electrochemical works, (49) 222.
- intake and translocation of salts, (44) 425.
- intergradation in, (49) 29.
- iodin in, (43) 204, 632.
- ionization of air by, (43) 225.
- Iowa honey, notes, (48) 359.
- iron in, studies, (50) 128.
- isolation and specific change, (41) 220.
- land, algal ancestry, (46) 524.
- law of minimum and stimulation in, (47) 128.
- laws regulating in Porto Rico, (44) 836.
- leaf structure and transpiring power, (49) 28.
- leaf water content, (49) 521.
- leguminous, *see* Legumes and Leguminous plants.
- light and shadow, studies, (41) 222.
- light in, physiology, (46) 224.
- light requirements, optimum, (44) Mass. 445.
- lime requirement, (47) 27.
- lithium in, (46) Colo. 28.
- littoral, of Madagascar, studies, (42) 224.
- loss of foliage, effect on disease resistance, (47) 45.
- magnesia injury to, (49) 628.
- malvaceous, (44) Tex. 135.
- manganese in, (47) 502; (48) Ky. 126; (49) 221; (50) 21, 221.
- manganese requirements, (49) 730.
- marine, cold resistance in, (42) 727.
- maritime, water economy of, (43) 223.
- medicinal, *see* Drug plants.
- milk tainting, (50) 878.
- mineral constituents of cotyledons, translocation, (41) 726.
- modifications under varying conditions, (46) 721.
- morphology and physiology, treatise, (48) 192.

Plants—Continued.

- mountain, osmotic pressure in, (41) 525.
- mucilage in, origin, (43) 132.
- natural coloring matters of, (48) 431.
- natural death of, (45) 221.
- natural grafting, (41) 522.
- naturalization, (50) 526.
- nectaries in, (45) 123.
- nematode injury to, notes, (44) Pa. 746.
- nematode parasitic on, (50) 452.
- new forms due to half and mass mutations, (43) 222.
- nitrogen metabolism, (47) 109.
- nitrophile, around manure heaps, (43) 430.
- normal diversity, (41) 522.
- occurrence of rarer elements in, (49) 617.
- of British Guiana, botanical identifications, (42) 348.
- of eastern Colorado, geographic description and distribution, (42) 224.
- of India, pH values, (48) 811.
- of India, studies, (41) 522.
- of Indian Desert, physiological anatomy, (49) 218.
- of Michigan, (41) 820, 821.
- of South America, new species, descriptions, (42) 224.
- oil, culture guide, (44) 137.
- oil, production and use, (47) 239.
- oil, production in East Africa, (44) 594.
- oil seed, culture in Germany, (43) 638.
- optimum nutrient solutions for, (44) 324.
- organic balance in, (42) 433.
- organic carbon nutrition, (42) 433.
- organic compounds, nature and significance, (45) 201.
- organic nutrition, (46) 224.
- ornamental—
 - blooming dates, (41) N.J. 42.
 - culture, (41) 339; (44) Minn. 336; (45) 455, Can. 833.
 - culture experiments, (41) Can. 538; (43) Can. 741; (47) Alaska 535.
 - diseases, (45) 444.
 - for Alaska, (41) Alaska 40.
 - for Canada, (41) 343.
 - for landscape planting, (49) 439.
 - for Mississippi, (44) 147.
 - for Missouri, (43) 838; (44) 45.
 - for Wisconsin, (41) 242, 835.
 - from China, (41) 448, 742.
 - grafting and budding, (45) 135.
 - in Niagara Falls Park, (41) 242.
 - insects affecting, (41) N.C. 660; (48) 52.
 - manual, (42) 43.
 - pruning, (45) 135, 348.
 - tests, (44) P.R. 442; (48) 31.
 - treatise, (50) 39.

Plants—Continued.

- ornamental—continued.
 - varieties for Minnesota, Minn. (42) 736; (47) 338.
 - variety tests, (43) Can. 741.
- osmotic pressure in, *see* Osmotic pressure.
- overgrowths in, (41) 152, 450.
- ovule transformation into ovary, (42) 820.
- oxalates in, (43) 327, 730.
- oxalic acid in, (45) 528.
- parasitized by fungi, respiration, (45) 48.
- pentosan content, relation to hardness, (46) 443.
- perception of gravity by, (41) 725.
- perennial—
 - chlorophyll-bearing organs, (46) 27.
 - for Alaska, (44) Alaska 336.
 - for hardy border, (43) 441.
 - for Missouri, (43) 838.
 - old age in, (43) 634.
 - treatise, (50) 39.
- perfume yielding and aromatic, (41) 339, 743; (42) 43.
- period between blooming and ripening, (41) 510.
- permeability in, *see* Permeability.
- phenological effect of bodies of water, (43) 523.
- phospho-organic reserve material, constitution and synthesis, (45) 202.
- phosphoric acid nutrition in, (48) 426.
- photocatalysis in, studies, (50) 525.
- photosynthesis in, *see* Photosynthesis.
- phototropic and geotropic reactions in, (48) 429.
- phototropic response, (42) 728, 730.
- phototropism in, (44) 824.
- phylogenetic studies, (43) 818.
- physical characters and capacity for yield, (42) S.Dak. 827.
- physiological salt balance, factors affecting, (44) N.J. 324.
- phytochemical investigations, (43) 820.
- poisonous—*see also* Cattle, Livestock, and Forage poisoning, and *specific plants*.
 - control methods, (42) 176, 879.
 - feeding experiments, (48) 168.
 - guide, (47) 81.
 - in the South, (44) 180.
 - of Canada, (43) Can. 380.
 - of Philippines, (48) 842.
 - of South Africa, (48) 774.
 - of United States and Canada, (43) 649.
 - of Utah and Nevada, (43) U.S.D.A. 77.
 - studies, (41) U.S.D.A. 565; (43) 470, U.S.D.A. 470, 471, U.S.D.A. 471; (44) Ariz. 581; (45) Nev. 782.
 - studies by experiment stations, (48) 604.

Plants—Continued.

- poisonous—continued.
 - to livestock, (43) Nev. 273; (45) Ariz. 478, Wyo. 479; (47) Oreg. 181, Nev. 786; (49) Wyo. 476, Nev. 582, Nev. 583, U.S.D.A. 583, Ind. 584; (50) 78.
 - to livestock and first aid, (49) 177.
 - to livestock in Alberta, (42) 776.
 - to livestock in New Mexico, (48) 277.
 - to livestock in Porto Rico, (47) 378.
- pollination, *see* Pollination.
- potted, auto-irrigation, (41) 631.
- prairie, subterranean anatomy, (43) 130.
- propagated asexually, degeneration, (47) 731.
- propagation, (46) R.I. 227.
- propagation in Tropics, (45) 439.
- propagation, treatise, (47) 235.
- radium action on as affected by light, (41) 523.
- rainfall interception by, (50) 315.
- reciprocal transplants, (41) 328.
- refrigeration, effect of nutrition and root activity, (45) 731.
- regeneration, quantitative laws in, (43) 821; (46) 128.
- relation between body size and organ size, (47) 821.
- relation of annuals, biennials, and perennials, (42) 818.
- relation to soil solution, (48) 18.
- resistance to cold, (43) 226.
- resistance to disinfectants, (43) 822.
- resistance to starvation, (45) 31.
- resistant to root knot nematode, (50) Ga. 553.
- respiration, *see* Respiration.
- response to changes in pH, (44) 324.
- response to stimulus, (41) 222, 724, 725.
- response to wireless stimulation, (43) 526.
- rest period, factors affecting, (45) Mo. 221.
- salt balance, relation to soil moisture, (48) 810.
- salt requirements, (45) 334; (46) 26.
- seasonal behavior, relation to temperature, (41) 819.
- selection in relation to meteorological conditions, (42) 511.
- selective action, (50) 524.
- self-sterility in, (41) 223, 430; (42) 527, 534.
- senescence in, (48) 829.
- serratulin in, (42) 333.
- sex in, reversal, (48) 127.
- sex intergradation in, (44) 219, 220.
- sexual reproduction, importance of length of day, (49) 326.
- shoot formation as affected by leaves, (41) 526, 727.

Plants—Continued.

- shoot-bearing tumors, effect on growth, (41) 728.
- shrinkage and elongation in rapid-growing shoots, (41) 429.
- smoke injury to, (45) 425, 821.
- solutes in, distribution, (44) 222.
- spermophyte shoots, (48) 728.
- spinose, origin and action, (41) 25.
- stature, as affected by light, (42) 333.
- stomata in, behavior and efficiency, (45) 336.
- stomata, studies, (41) 329, 429, 819.
- strontium in, (46) Colo. 28.
- suberin and cutin in, (45) 732; (46) 631.
- submerged, assimilation by, (49) 423.
- succulence and acidity, variations, (41) 29.
- succulence in, basis, (42) 432.
- succulent, chemistry of, (45) 108.
- succulent, culture and propagation, (49) 836.
- succulent, gas interchange, (41) 28.
- succulent, origin and action, (41) 25, 133.
- sulphocyanic acid in, (44) 825; (48) 727.
- supplemental list from southeastern Alaska, (46) 222.
- swelling, auxographic measurement, (44) 727.
- symbiormorphoses through grafting, (41) 522.
- symbiosis in, (49) 819.
- taxonomic criteria, (41) 330.
- tendrill tips, regeneration of, (43) 525.
- titanium in, (44) 210; (46) Colo. 28.
- torsions produced by geotropism in, (45) 31.
- toxic effect on one another, (43) 29, 327.
- toxicity of borax for, (49) 217.
- toxicity of smelter emanations for, (49) 127.
- transpiration, *see* Transpiration.
- transplant quadrats and areas, (49) 30.
- transplanting, fall v. spring, (43) Mo. 141.
- transport of organic substances in, (48) 430.
- tropical, liquid fuel from, (47) 207.
- tropism, transmission of stimulus causing, (44) 823.
- tryptophan detection in, (48) 503.
- tumor production in, (45) 647.
- tumor-like formations in, (49) 820.
- twining, contact sensitivity, (43) 525.
- underground runners, (41) 522.
- used as insecticides, (41) 56.
- utilization of dextrose and levulose, (42) 728.
- utilization of rock phosphate, (46) 21.
- vacuomes in, (45) 30.
- variability in, new type, (49) 567.
- variegated, non-Mendelian inheritance in, (43) 433.

Plants—Continued.

- variegated, periodicity in, (42) 332.
- variegation in, (43) 433; (49) 128.
- varieties, agronomic placement, (46) 829.
- vascular apparatus in, (47) 127.
- vascular, developmental selection, (49) 425.
- vascular, tracheary cells, variation in, (44) 521.
- vegetative points, studies, (43) 130.
- virus diseases, (50) 244.
- vitamin requirements, (45) 28.
- volunteer, parasites in, (49) 839.
- water as affected by light, (43) 431.
- water balance, significance, (45) 730, 731.
- water movement in, (42) 334, 729; (44) 824.
- water requirement as affected by environment, (41) 631.
- wild, of Germany, useful, (41) 742, 743.
- wild, prolonged activities, (47) U.S. D.A. 17.
- wild, use for food, (47) 612.
- wild, uses, treatise, (43) 649.
- wilting, relation to rapid growth, (41) 429.
- wilting, relation to water-supplying power of soil, (45) 527.
- wilting, studies, (41) 329; (49) 521.
- winter blooming at Washington, D. C., (44) 221.
- winter injury, (42) 541.
- xerophytism in, (45) 335.
- yield capacity, (42) S.Dak. 827.

Plasma—

- and corpuscles, analyses, (47) 205.
- calcium determination in, (47) 14.
- colloidal constituents, action of salts on, (50) 426.
- magnesium determination in, (48) 11.
- proteins, determination, (47) 205.

Plasmodiophora—

- brassicæ, *see* Cabbage clubroot.
- humuli, notes, (47) 45.
- sp., notes, (47) 248.
- vascularum n.sp., description, (46) 551; (48) 49.
- vascularum, notes, (45) 443; (49) 539; (50) 351.

Plasmodium—

- bubalis, description, (42) 381.
- falciparum, infection of *Anopheles ludlowi* with, (43) 854.
- spp., infection of *Anopheles* by, (42) 652; (44) 656.
- vivax, infection of *Anopheles* with, (43) 55.

Plasmopara—

- cubensis, notes, (49) N.C. 747.
- ribicola spores as affected by cuprammonium washes, (43) N.H. 44.
- viticola, biology, (47) 749.
- viticola, notes, (41) 349; (42) 49; (45) 147.

- Plasmodium—Continued.
 viticola, outbreaks in Italy, (50) 149.
 viticola, spore germination in, (48) 148; (50) 249.
- Plasmodium, systematization and biology, (45) 747.
- Plaster, composition, manufacture, and properties, (48) 589.
- Plasticity, methods for measuring, (50) 417.
- Plastidome in asparagus, (45) 30.
- Plastidome in plant cells, (44) 822.
- Plastids—
 evolution of, (45) 30.
 in *Preissia* and corn, (44) 221.
 origin, (46) 722.
 parasitism and resistance, (50) 244.
 primordia, (47) 223.
- Plastometer, use with paint, (42) 890.
- Plat competition, errors from, (42) 27.
- Plat experiments—
 as affected by size and arrangements, (44) 214.
 elimination of error, (41) 635.
 error and technique, (47) Mo. 329.
 heterogeneity as factor affecting yields, (43) 526.
 importance of soil variation in, (47) Ill. 814.
 methods of labeling, (44) 228.
 permanence of differences in plats, (44) 631.
 probable error in, (43) 527.
 procedure in, (47) 814.
 technique, (41) 432, Minn. 730; (44) 512; (45) 528, 529.
- Platyphena scabra, notes, (43) Conn.State 251, N.C. 450; (44) Mass. 453; (47) N.Y. Cornell 848; (50) 256.
- Platyphena scabra, studies, (42) 649; (43) 759.
- Platonia insignis seeds, oil from, analyses, (47) 803.
- Platycoelostoma, new genus, erection, (49) 851.
- Platycurus 4-vittata, notes, (41) Fla. 548.
- Platyedema ellipticum on *Polyporus gilvus*, (42) 252.
- Platyedra—
 and *Pectinophora*, synonymy, (41) 258.
 gossypiella, bionomics of, (47) 357.
 gossypiella in South India, (49) 556.
- Platygaster—
 hiemalis, twinning and monembryonic development, (50) 158.
 sp., polyembryonic broods, studies, (42) 656.
 spp., notes, (43) 259.
 vernalis and hiemalis, comparison, (47) 554.
 vernalis, parasite of Hessian fly, (50) 58.
- Platymetopus hyalinus, notes, (44) 351.
- Platynota sp., notes, (43) 851.
- Platynota tinctana on citrus, (45) 360.
- Platyptera poeciloptera, notes, (48) 56.
- Platyptidae, food plants, (48) 153.
- Platyptilia sp., notes, (47) 853.
- Platypus compositus on sweet potatoes, (43) 163.
- Platyterma, notes and new species, (41) 847.
- Plays for the country theater, (48) 693.
- Plectodiscella veneta, notes, (45) 751; (49) Iowa 746.
- Pleococcum populinum, notes, (41) 55.
- Pleospora—
 ascospore discharge, (41) 746.
 graminea, notes, (43) 45.
 herbarum, description, (49) 445.
 herbarum, notes, (42) 150.
 nicotianae n.sp., notes, (50) 248.
 pomorum n.sp., description, (46) 243.
 pomorum, notes, (45) 546.
 trichostoma, notes, (45) 49; (46) 545.
- Plesiocoris rugicollis, notes, (44) 453.
- Plesiothrips perplexus on corn, (43) Conn. State 252.
- Plesispa reichel, notes, (41) 758; (49) 658.
- Pleuropneumonia—see also Pneumonia.
 bovine—
 cultivation of virus, (47) 387.
 diagnosis, (43) 786; (45) 787; (46) 582, 883.
 histopathological studies, (48) 880.
 in East Africa, (49) 785.
 serological diagnosis, (48) 484.
- contagious—
 bovine, control, (43) 584.
 bovine, immunization and diagnostics, (47) 81, 485.
 bovine, notes, (48) 579.
 equine, and gripe, comparison, (46) 278; (48) 676.
 eradication, (43) U.S.D.A. 471.
 prophylaxis and treatment, (41) 576.
 exudative, in goats, (45) 787.
 notes, (41) 580.
- Pleuroprucha insularia, notes, (49) 154.
- Pleurotropis—
 anomala, parasitism by, (45) 663.
 benefica n.sp., description, (45) 663.
 epigonus, distribution, (46) 464.
 utahensis, parasitism by, (43) U.S.D.A. 260.
- Pleurotus—
 colae, notes, (42) 145.
 ostreatus, notes, (48) 451.
 sapidus, studies, (44) 27.
- Plocaederus obesus, notes, (46) 51.
- Plodia interpunctella, see Indian meal moth.
- Plow bottoms, studies, (42) 84, 85.
- Plow for furrow-manuring citrus groves, (41) 741.
- Plowing—
 by electricity, (48) 888.
 deep plowing, and subsoiling, comparison, (49) Ohio 388.

Plowing—Continued.

- depths, effect on nitrate production, (41) Mo. 623.
- effect on crop yields, (42) 132.
- experiments, (42) 283; (45) N.Dak. 212.
- fall v. spring, (42) Wis. 323; (50) West.Wash. 195.
- fall, v. subsoiling, (42) Wis. 323.
- mold-board v. disk, (42) 786.
- new implements for, (47) 391.
- relation to soil moisture content, (41) 129.
- tractor, *see* Tractor.
- v. disking, (41) Nebr. 434.
- with tractors, horses, and cattle, costs, (48) 91.

Plows—

- American v. Canadian, tests, (44) 587.
- and plowing, (44) 587.
- design and operation, (46) 100.
- effect of speed on draft, (42) 95, 686; (44) Calif. 786.
- factors affecting draft, (44) 198; (45) 590.
- for mechanical cultivation, (42) 588.
- garden hand, tests, (49) 486.
- important improvement in, (49) 486.
- left-hand, studies, (48) 198.
- marsh, development, (48) 196.
- mole, worked by horses, (41) 586.
- motor—
 - in France, (42) 588; (43) 289.
 - in Italy, (42) 893.
 - operating cost, (45) 797.
 - tests, (42) 488, 587; (45) 186, 589, 590.
- reaction to various hitches, (48) 90.
- riding, for cotton, (41) U.S.D.A. 696.
- soft center steel, hardening, (44) 688.
- speed draft tests, (47) Iowa 792, Nebr. 792.
- tests for first breaking of peat lands, (49) 686.

tractor—

- construction and operation, (42) 588.
- effect of speed on draft, (45) Mo. 290.
- light, design, (43) 288.
- tests, (44) 287; (46) 87.
- tests in France, (42) 588.

Plowshares, wearing test, (47) Calif. 687.

Plum—

- aphid, mealy, studies, (41) U.S.D.A. 163.
- aphid, new, description, (44) 853.
- aphids, control, (46) 855; (47) Idaho 759.
- bacterial infection, (49) 44.
- black knot, control, (42) 353.
- blotch, (46) 348.
- bracket fungus, notes, (44) 48.
- brown rot—
 - ascigerous stage, (47) 546.

Plum—Continued.

brown rot—continued.

- control, (41) Iowa 237, 348; (45) 450; (46) Mich. 552; (47) Mich. 450.
- effect on fruit, (46) 553.
- notes, (41) 844; (43) 45, 349; (44) 48; (48) 242.
- nutrition, (44) Minn. 746.
- relative resistance to, (50) 47.
- chlorosis, cause, (47) 242.
- crown gall resistant varieties, Calif. (42) 843; (44) 743.
- curculio, control, (41) 341; (42) N.J. 849; (45) 253.
- curculio in Georgia, studies, (49) 659.
- curculio in South Dakota, (41) 59.
- curculio, notes, (44) N.J. 349; (48) 52, N.J. 353; (49) N.C. 757.
- curculio on peach, control, (50) 453, U.S.D.A. 662.
- diseases and pests, remedies, (45) Wash. 44.
- diseases, notes, (43) Ill. 847; (44) Wash. 53, Calif. 744.
- diseases, parasitic, during 1915–1920, (49) 445.
- diseases, spray schedule, (42) Wash. 836.
- drought spot, notes, (46) 452.
- foliage, injury from sprays, (47) Mass. 646.
- gouger in South Dakota, (41) 59.
- hog, durability tests of wood, (43) 44.
- leaf disease, (42) 49.
- leaf miner, life history and control, (42) 650.
- leaf spot, notes, (45) 541; (47) Mich. 450.
- lice, mealy and rusty brown, (41) 59.
- pocket, treatment, (41) 844.
- pockets, notes, (44) Calif. 744.
- rust, notes, (41) 154; (43) 45.
- sawfly, control, (44) S.Dak. 555; (47) 257.
- sawfly in Japan, (42) 159.
- sawfly, studies, (42) S.Dak. 850.
- sawfly, web-spinning, (41) 59; (46) 58.
- shoot wilt and canker, studies, (49) 248.
- shot hole, notes, (44) 48; (45) 541.
- silver-leaf, notes, (41) 750; (42) 846; (44) 346; (45) 48; (49) 845.
- slug, notes, (47) 848.
- spider mite, notes, (48) 852.
- stocks, test, (49) N.Y.State 38.
- sun scald, notes, (45) 842.
- tree borer in South Dakota, (41) 59.
- withertip, notes, (46) 741.

Plumbing, modern, treatise, (48) 91.

Plumbing pipe, tests, (41) 587.

Plums—

- as affected by freeze, (48) N.J. 339.
- Bartlett, as ornamental tree, (42) Ohio 837.

Plums—Continued.

blossom bud formation, effect of defoliation, (49) Wis. 140.
 blossoming period, (43) U.S.D.A. 437.
 breeding, (47) Minn. 338.
 breeding experiments, (42) Minn. 834; (43) 742; (44) 145; (46) 39; (49) S.Dak. 533; (50) Can. 36, Minn. 140.
 budding and grafting test, (45) 742.
 California, ripening, (47) 39.
 composition as affected by *Sclerotinia cinerea*, (50) 47.
 culture, (43) Nebr. 644; (44) Mont. 337; (47) Colo. 439; (48) Minn. 338.
 culture at high altitudes, (44) Colo. 234.
 culture in Arizona, (50) U.S.D.A. 138.
 culture in Canada, (46) 234.
 culture in Minnesota, (41) Minn. 387.
 disease resistant, chemical composition, (42) Minn. 841.
 dormancy and hardiness in, (48) 524.
 dropped, studies, (48) Del. 634.
 effect of low temperature on first-year wood, (47) Minn. 348.
 frost resistant varieties, (45) 346.
 fruit setting studies in New Zealand, (41) 445.
 fruitfulness, relation to weather, (41) 445.
 girdling experiments, (41) 445; (48) Calif. 534.
 hardiness studies, (45) N.Dak. 236.
 hardiness, testing by freezing points, (50) Minn. 125.
 hardy varieties, (43) Minn. 833.
 harvesting and handling, (47) Calif. 536.
 hybrid, new, (42) 639.
 in England, histories, (43) 744.
 inheritance of morphological characters, (45) 539.
 insects affecting, (44) Mo. 754.
 marketing, cold storage as aid, (48) Calif. 39.
Monilia on, behavior, (42) 150.
 new variety, (45) 139.
 orchard survey, (43) Colo. 144.
 petiolar glands in, (44) 730.
 pollen development in Minnesota, (42) 535.
 pollination experiments, (42) Calif. 41, 534, 535, Calif. 832; (43) 541; (45) 346; (47) Calif. 639; (48) Calif. 534; (49) Calif. 40.
 premature fruit cast in, (47) 328.
 pruning experiments, (41) 445; (42) Calif. 139; (45) 439; (48) Mich. 536.
 pruning, relation to fruit bearing, (49) N.Y. Cornell 638.
 root development, (48) 736.
 rotted by *Sclerotinia*, analysis, (50) 48.
Sclerotinia affecting, (50) Minn. 148.

Plums—Continued.

self-fertility and sterility in, (46) 39.
 self-fertility and cross-incompatibility in, (49) 234.
 spray residue on, (47) U.S.D.A. 360.
 spray schedule for, (42) Ark. 736; (43) N.J. 37; (44) Mo. 535; (47) Ohio 140; (49) N.J. 138.
 spraying and dusting, (44) Mich. 144.
 spraying experiments, (44) S.C. 533.
 sterility studies, (45) Wis. 236, 641.
 stock experiments, (50) N.Y.State 539.
 stocks for, (44) 145; (45) 742; (47) 238; (48) 39; (49) N.Y.State 340.
 storage studies, (46) 338; (47) Calif. 639.
 thinning experiments, (43) Ohio 341; (50) Can. 340.
 time of fruit bud differentiation, (49) 834.
 varieties, (48) Can. 37, N.Dak. 235; (49) Mont. 136; (50) Mont. 139.
 varieties at San Antonio, (47) U.S.D.A. 438.
 varieties for Delaware, (44) Del. 440.
 varieties for Minnesota, (41) 147; (42) 637, 639, Minn. 834.
 varieties, new, (41) S.Dak. 238; (44) 146.
 variety tests, (43) U.S.D.A. 144, Minn. 833; (44) 533; (46) S.C. 733; (50) Mont. 139, Can. 440.
 winter injury, (43) U.S.D.A. 435.
 winter study, (46) 839.
Plusia chalcites, control, (48) Hawaii 355.
Plusia rogonationis, notes, (49) 53.
Plutella maculipennis, see Diamond-back moth.
 Pneumatic tires, fabric stresses in, (50) 486.
 Pneumococcus—
 antigen, nature of, (49) 880.
 as affected by antipneumococcic serum, (42) 73.
 as affected by vitamins in animal tissue, (41) 574.
 culture, (41) 778.
 cultures, peroxid in, (50) 787.
 growth, effect of plant tissue, (50) 184.
 H-ion concentration of, (43) 383.
 immune sera, increasing opsonization and agglutination, (44) 477.
 immunization, (44) 375; (48) 278; (49) 880.
 infection, chemotherapy, (41) 476.
 infection, relation to vitamin B deficient diet, (47) 368.
 inoculations, testing efficiency, (41) 577.
 meningitis in rabbits, experimental, (42) 880.
 protective substances in chicken serum, (46) 775.
 retardative effect of blood of immune animals, (42) 567.
 vaccine, preparation, (43) 76.

- Pneumonia—*see also* Pleuropneumonia.
 contagious, etiology, (49) 684.
 contagious, of goats, (46) 883.
 in calves, (44) Minn. 778; (48) 282;
 (49) 79; (50) 878.
 in chicks, (47) Okla. 883.
 in lambs, (43) Wyo. 179.
 in sheep, bacteriologic study, (49) 681.
 in sheep, diplococcus associated with,
 (49) 786.
 in sheep, progressive, (49) Mont. 178;
 (50) Mont. 182, 481.
 in sheep, verminous, (43) 384.
 in swine, (45) 680; (47) 80.
 in swine, rôle of *Pseudomonas pyocy-*
aneus in, (45) 381.
 specific infectious, of foals, (50) 685.
Pnyxia scabiei, notes, (49) 254.
Poa glumaris as hay crop, (41) Alaska 30.
Poa pratensis as hay crop, (41) Alaska 31.
Poa spp., analyses, (41) Wyo. 333.
Podagron crassiclava n.sp., description,
 (48) 59.
Podalgus humilis, notes, (45) 558.
Podontia 14-punctata—
 life history, (47) 658.
 notes, (49) 255.
Podosphaera—
leucotricha, notes, (41) 154, 657; (43)
 246, U.S.D.A. 549; (44) 346; (47)
 44; (50) 750.
leucotricha spores, overwintering, (48)
 827.
oxyacanthae, parasitic *Cicinnobolus* in,
 (49) 145.
 sp., notes, (44) 445.
Podosporium theobromicolum, notes, (45)
 653.
 Podsol soils—
 formation, (47) 19.
 morphological studies, (49) 117.
 of forest regions of Sweden, (44) 212.
Poecilocoris hardwickii, notes, (44) 851.
Poecilopsis rachelae, habits, (44) 753.
 Poha, jellifying properties, (49) Hawaii 411.
 Poison bait—
 for cutworm control, (44) 653; (47)
 757.
 for European earwig, (49) 850.
 for grasshoppers, (43) 353; (44) 58,
 U.S.D.A. 162, Mont. 348; (45) 853;
 (46) 53, 657; (48) Mont. 153, Mich.
 251, Nebr. 551.
 for grasshoppers and worms, (47)
 757.
 for onion maggot, (44) N.J. 350; (47)
 Pa. 459; (48) 252.
 for rodents, preparation, (45) 550.
 mixer, homemade, (47) 53.
 Poison bran mash, formulas, (50) Colo.
 52.
 Poison ivy—
 description and remedies, (44) U.S.
 D.A. 223.
 insects affecting, (41) 759.
 monographic account, (50) 181.
 Poison sumac, description and remedies,
 (44) U.S.D.A. 223.
 Poisoning in *Spirogyra*, physiology, (47)
 821.
 Poisonous plants, *see* Plants, poisonous.
 Poisons—
 economic, use in California, (41) 662.
 organic and inorganic, notes, (44) 56.
 sensitiveness of avitaminous animals
 to, (46) 470.
 Polarimeter, development, (44) 413.
 Polarimetry, new sodium lamp for, (46)
 111.
 Polariscope, for determining jellifying power
 of gelatins and glues, (44) 313.
 Polders of Holland, formation by silting,
 (42) 420.
 Polenske value as affected by atmospheric
 pressure, (44) 412.
 Poles for electrical service, treatment, (44)
 686; (49) 485.
 Policephalomyelitis, acute, studies, (41)
 876.
 Poliomyelitis—
 patients, *Bacillus botulinus* A in ex-
 creta of, (47) 170.
 relation to insects, (49) 450.
 Polish Institute for Agricultural Research,
 (47) 200.
Polistes macaensis, notes, (43) 52.
Polistes spp., life histories, (41) 853.
 Pollack liver oil, potency of, (50) 665.
 Pollen—
 age, effect on hybrids, (46) 721.
 and pollen enzymes, (48) 727.
 barley, germination of, (42) 820.
 behavior of, studies, (43) 328.
 development in *Cinnamomum*, (43)
 328.
 forest tree, distribution, (41) 46.
 grains and ovules of *Datura* mutants,
 (47) 222.
 grains, formation, appearance of
 chondriomes in, (45) 31.
 grains in the upper air, (49) 747.
 longevity, studies, (46) N.Y. Cornell
 828.
 nutritive layer of, (43) 525.
 physiology of, (42) 225.
 preservation, (41) 343.
 studies, (48) 828.
 tube growth, studies, (41) 430.
 types, phylogenetic significance, (43)
 328.
 Pollination—*see also specific plants*.
 apparatus for sugar cane, (46) 135.
 discussion, (44) 133.
 effect on life of flowers, (44) 44.
 experiments, (47) 742, 757.
 in orchards, (46) 840.
 natural cross, in soy beans, (49) 425.
 of rye and wheat, studies, (42) 734.
 rôle of bumblebees in, (46) 840.
 rôle of climate in, (42) Calif. 41.
 studies, (41) 330; (43) 237; (46) 39;
 (48) 736; (49) 29.
 studies of Indian crops, (44) 633.

- Pollinator, corn, construction and use, (42) 726.
- Pollinia fulva*, analyses, (50) 168.
- Polyactis galanthina*, notes, (47) 548.
- Polyarthritidis* in swine, etiology, (47) 587.
- Polycaon* spp., notes, (44) 256.
- Polychrosis botrana*, notes, (45) 454.
- Polychrosis viteana*, see Grape berry moth.
- Polycotyledony*, evolutionary status of, (43) 133.
- Polydactylism*—
in cattle, (45) 874.
in horses, (49) 165.
in six generations, (48) 763.
- Polyembryony*—
and sex, studies, (42) 656.
in *Poa pratensis*, (49) 528.
- Polygonotus vernalis* and *hiemalis*, comparison, (47) 554.
- Polygonum cuspidatum*, control, (44) Pa. 737.
- Polynema eutettixi*, parasitism by, (44) 654.
- Polyneuritic pigeons*, hematology of, (48) 761.
- Polyneuritis*—
and inanition, studies, (48) 565.
avian, alcoholic extracts of yeast for, (46) 569.
avian, nature of paralysis, (46) 669.
avian, production by synthetic ration, (45) 166; (46) 570.
avian, studies, (46) 668, 669.
blood of pigeons in, (50) 860.
changes in glands during, (50) 265.
decreased activity of smooth muscle in, (46) 470.
diagnosis, (44) 172.
effect of tyramin on, (49) 462.
gallinarum, effect of feeding and starvation, (42) 366.
gallinarum in pigeons fed deficient diet, (42) 463.
impaired gaseous metabolism of cells in, (48) 556.
in pigeons—
as affected by adrenalin, (49) 769.
as affected by atropin, (49) 769.
as affected by pilocarpin, (49) 769.
disturbances in cellular metabolism, (49) 766.
effect of yeast, (44) 559.
new term for, (43) 861.
metabolism and respiratory exchange in, (47) N.Y.State 465.
nature of, (42) 366.
relation to antineuritic value of diet, (42) 365.
studies, (41) 265, 765, 766, 874; (49) 358, 359.
- Polyopeus* n.g. and n.spp., description, (46) 243.
- Polypeptids*, titration applied to, (50) 802.
- Polyphenols*, detecting, (49) 805.
- Polyphylla decemlineata*, notes, (47) 758.
- Polypodium Alternaria* disease, (48) 248.
- Polyporoids*, insect enemies of, (44) 57.
- Polyporus*—
amarus, control, (44) U.S.D.A. 156.
cinnabarinus, notes, (45) 842.
dryadeus on conifers, (48) 249.
igniarius on grapevines, (47) 49.
lignosus, notes, (42) 145, 542; (48) 45; (50) 42.
lignosus on cacao, (42) 350.
lucidus, enzym action in, (44) 27.
lucidus, notes, (41) 658.
pargamenus, biology of, (43) 552.
rugulosus, notes, (47) 548.
schweinitzii, notes, (45) 548; (48) Can. 51.
schweinitzii, studies, U.S.D.A. (42) 248; (49) 755.
sp., notes, (42) 51; (43) 243.
spp., notes, (44) Conn.State 149, 347; (46) 741.
tsugae, notes, (46) 348.
volvatus, enzym action in, (48) 353.
- Polyptychus dentatus*, life history, (45) 658.
- Polysaccharids*—
chemistry of, (45) 203, 204.
monograph, (45) 310; (49) 803.
new fungus destroying, (43) 523.
- Polysaccum crassipes*, notes, (41) 453.
- Polyscelis modestus* n.sp., description, (48) 59.
- Polyspora lini* n.g. and n.sp., description, (48) 46; (49) 543.
- Polystictus*—
cinnabarinus, notes, (45) 653.
spp. on timber, (44) 751.
spp., studies, (44) 27.
- Polystoma algarum*, life history and habits, (50) 850.
- Polysulphid*—
ammonium wash, notes, (41) 751.
oxidation in sheep dip, (47) 587.
solutions, fungicidal value, (44) 151.
- Polysulphids*, alkaline, action on *Oidium*, (41) 845.
- Polytoca barbata*, analyses, (45) 376.
- Polyzime*, starch liquefying power, (43) 503.
- Pomace*, feeding value, (42) 769.
- Pomace* flies as affected by breeding and temperature, (41) 868.
- Pomegranate*—
beverage, preparation, (49) Calif. 412.
juice, manufacture, (43) Calif. 717.
root bark, taenical value, (46) 687.
sirup preparation, (48) Calif. 507.
- Pomegranates*—
culture experiments, (48) U.S.D.A. 235.
varieties for Arizona, (50) U.S.D.A. 138.
- Pomelos*, see Grapefruit.
- Pomology*—
commercial, disease factor in, (49) 845.

Pomology—Continued.

- textbook, (47) 832.
 trend of research in, (48) 636.
Pongamia glabra cake, fertilizing value, (41) 816.
 Ponies, pasturing experiments, (46) Guam 763.
Pontia monuste, notes, (42) 52; (45) V.I. 150.
Pontia rapae, see Cabbage butterfly and Cabbage worm, imported.
 Pop corn—
 feeding value, (47) Md. 73.
 growth in alkali soil, early, (42) Utah 28.
 popping conditions, (50) N.Y.State 535.
 prehistoric, (46) 467.
 varieties, (49) Mich. 432.
 variety tests, (48) Hawaii 331; (49) 329.

Popillia japonica, see Japanese beetle.

Poplar—

- as affected by chloropicrin, (45) 28.
 bacterial canker, treatment, (43) 552.
 balsam, root habit, (41) 634.
 black, leaves and twigs, feeding value, (45) 774.
 borer, control, (44) U.S.D.A. 355.
 Canadian, culture experiments, (48) N.Dak. 239.
 canker, control, (45) 46.
 canker, European, (44) Conn.State 150.
 canker, European, in Pennsylvania, (41), 546.
 canker, notes, (45) 550; (47) 355, Ariz. 754; (50) 754.
 Carolina, diseases and pests, (41) 55.
 disease, notes, (43) 449, Ariz. 749; (45) 550.
 girdler, notes, (41) Conn.State 159.
 leafhopper, life history, (42) 749.
 leafhopper, notes, (41) 549; (44) 351; (46) 852.
 leaf-miner in New Jersey, (41) 549.
 leaf-mining beetles, (42) 454.
 leaf-stem gall aphids, notes, (44) 654.
 longhorn, large, studies, (45) 361.
 microscopical studies, (48) 540.
 rusts, studies, (41) 353.
 scale in South Dakota, (41) 59.
 white heart rot, notes, (48) Can. 51.

Poplars—

- Cytospora chrysosperma* on, (46) 850.
 in Europe, (49) 837.
 satin moth affecting, (44) 252; (45) U.S.D.A. 153.
 use against drifting sand in drainage ditches, (49) Mich. 439.

Poppies—

- and pods, analyses, (44) Ariz. 568.
 culture, (43) 638.
 fertilizer experiments, (42) 223.
 oriental, test of stocks, (43) 240.
 varieties for oil production, (44) 138.

Poppies—Continued.

- variety tests, (41) 242.
 wild, destruction in cereals, (46) 138.
 Poppy—
 bacterial disease, studies, (41) 543.
 disease, notes, (45) 48.
 disease survey in India, (46) 544.
 Iceland, disease, control, (43) 49.
 mildew, notes, (44) 445.
 opium, flower color in relation to morphine content, (46) 125.
 seed cake as cattle food, (43) 777.
 seed cake, composition and digestibility, (45) 269.
 seed, development of nitrogen and oil content, (47) 128.
 seed oil, digestibility, (42) 552.
 seed oil, production, (46) 636.
 Population—see also Rural population.
 of United States, cityward trend, (47) 394.
 relation to agricultural production, (43) 693.
 relation to agriculture, (49) 568.
 urban and rural, in Australia, (46) 695.
 Populist movement in Georgia, (49) 93.
 Populus spp., notes, (42) Calif. 838.
 Populus tremula, use as fiber plant, (44) 435.
 Porcellio laevis, notes, (50) 255.
 Poria—
 hypobrunnea, notes, (42) 646, 846; (45) 843; (47) 548; (49) 652.
 ravenalae, notes, (47) 547.
 vaporaria, notes, (44) 347.
 xantha, notes, (44) 651.
 Pork—
 American, marketing in England, (48) U.S.D.A. 572.
 and pork products, gastric response to, (41) 857.
 and pork products, international trade, (41) U.S.D.A. 892.
 antineuritic value, (50) 859.
 cold storage holdings, (49) U.S.D.A. 893.
 cold storage, treatment and cooking, (44) 61.
 cost and price indexes, (43) Mo. 792.
 cost of production, (42) Mich. 397; (43) 773.
 cost of production in England, (45) 377.
 curing and preservation, (45) 260.
 curing in warm weather, (47) N.C. 575.
 curing on the farm, (41) 617, 488; (42) Kans. 113, Iowa 470, 507.
 curing, shrinkage as affected by feed, (43) N.C. 465.
 cysticercosis, notes, (41) 879.
 international trade, (46) 675.
 killing, and canning, (44) U.S.D.A. 859.
 killing, cutting, and curing, (50) 272.

Pork—Continued.

preparation on the farm, (46) 808;
(48) 476.

production, (44) 571.

production—

and marketing, (42) 268.

as affected by pastures, (43) 773.

in Missouri, (50) 174.

principles, (48) 476.

value of first cross in, (49) 170.

products—

commercial outlook, (50) 594.

curing, English methods, (49)
470.

curing process, effect on trichinae,
(44) U. S. D. A. 79.

quality as affected by feed, (49) 68.

quality, effect of feeding peanuts, (42)
Okla. 267; (47) N.C. 575.

soft, changes during curing, (42) Tex.
170.

soft, factors affecting, (44) 178.

soft, shrinkage, (48) U.S.D.A. 171.

soft, studies, (43) Fla. 775; (44)

Ala.Col. 773; (45) Fla. 271; (46)

Tex. 365; (47) Ga. 475; (49) Miss.

469, Ga. 573, N.C. 775, Fla. 873.

trichinae in, destruction, (41) 684;
(48) 882.

Poronidulus conchifer, notes, (50) 656.

Porosagrotis orthogonia—

control, (46) 153; (49) Mont. 251.

distribution, (50) 846.

forecasting outbreaks, (49) 155.

meteorological relations, (49) Minn.
759.

notes, (43) Mont. 758; (44) Mont.
348; (47) 852; (48) U.S.D.A. 52;

(50) 151.

parasites of, (46) 247.

studies, (50) Mont. 155.

summary, (44) Mont. 757; (46) 352.

Porthetria dispar, see Gipsy moth.

Porto Rico—

Insular Station, notes, (45) 700; (46)
796; (47) 700; (48) 898; (49)
498.

Insular Station, report, (42) 92, 694;
(45) 496; (47) 898; (49) 599.

Station, notes, (43) 100, 600; (47)
100; (49) 299, 698; (50) 196,
398.

Station, report, (44) 297, 495; (45)
698; (48) 298; (50) 597.

University, notes, (44) 397; (47) 198;
(49) 299.

Portulaca, inheritance of special traits,
(49) 24.

Portulaca oleracea, use for greens, (42)
138.

Posidonia oceanica, fertilizing value, (42)
526.

Posts, see Fence posts.

Pot culture experiments, (50) 819.

Pot culture experiments, source of error in,
(49) 120; (50) 617.

Potash—

active, in soils, effect of cropping, (50)
118.

Alsatian, (46) 522.

alum, recovery, (45) 216.

American, source and value, (46) 626.

American, sources, (42) U.S.D.A. 329;
(43) 519.

American v. German, (45) Ind. 121.

ammonia, and phosphoric acid, pro-
portions for fertility, (49) Ohio 323.

analyses, Alsatian and German, (44)
515.

and kainit, comparison, (44) 515.

and magnesia fertilization, (50) 724.

and phosphates, comparative value for
grain, (41) 825, 826.

and phosphoric acid, fertilizing value,
(44) 214.

assimilation as affected by lime, (47)
818.

availability in soil-forming minerals,
(47) Tex. 26.

available in soils, determination, (50)
118, 412.

bearing minerals in Norway, (50) 521.

bearing shale for soil improvement,
(46) 626.

brines, evaporation, (48) 428.

content of oats as affected by fertiliz-
ers, (43) 322.

deposits in Alsace, (42) 23, 392, 430,
723; (44) 129, 422; (49) 517.

deposits in Eritrea, (43) 428.

deposits in Germany, origin, (42) 523,
723; (44) 322, 422.

deposits in South Africa, new, (42)
430.

deposits in Spain, (42) 815; (43) 728.

deposits in United States, (44) 217.

deposits in west Texas, (46) 719.

determination, (41) 504, 799; (43)
115; (45) 716; (48) 609; (49) 111.

determination—

centrifugal method, (45) 504.

in fertilizer materials, (42) 109.

Lindo-Gladding method, (44) 803.
method, (42) 709.

of active value in soil, (45) 214;
(47) 24.

different forms, comparison, (41) Mass.
21, N.C. 625.

effect on—

availability of phosphoric acid,
(50) 818.

barley straw, (41) 733.

bearing orchards, (44) Oreg. 837.

cotton wilt, (50) 45.

development and composition of
crops, (49) 816.

lodging in cereals, (42) 530.

electro, fertilizing value, (41) 326.

exploration in New Jersey greensands,
(43) 817.

extraction from silicate rocks, (42)
624.

Potash—Continued.

fertilization, (46) 424.
 fertilization, effect on crops, (48) 720.
 fertilization of moor soils, (46) 215.
 fertilizer salts, crust-forming action, (47) 124.
 fertilizers—
 elimination of borates from, (47) 728.
 in England, (43) 26.
 mining and manufacture, (41) 423.
 sources, (46) S.C. 717.
 use, (49) 817.
 fertilizing value, (41) Del. 136, Me. 143, 228, 628; (42) 107, 221, Wis. 327, 328, 430, 516, 625, N.J. 812; (43) Tex. 33; (44) 317, 319, Del. 420, 422, 515, Conn. Storrs 529, Oreg. 719, 817; (45) Del. 622; (46) Mass. 19; (47) S.C. 24, Minn. 320, 728; (48) Can. 323, 518, Mo. 616, Del. 620; (49) La. 824; (50) Minn. 121.
 fertilizing value on peat soil, (46) 216.
 field in western Texas, (49) 817.
 for cotton, (41) Ala. Col. 336.
 from ashes of molasses, (44) 627.
 from blast furnaces, (41) 325, 629; (42) 522, 523; (47) 219.
 from bracken, (41) 629.
 from by-products, effect on soil and plants, (42) 329.
 from cement dust, (41) 518; (42) 124, 221, 815; (46) 220.
 from feldspar, processes for separation, (43) 519.
 from greensand, (46) 719.
 from greensand as affected by manure-sulphur composts, (41) 799; (43) 517.
 from greensand, availability, (41) N.J. 23.
 from kelp, (41) 508; (43) 630; (44) 23; (46) 23; (48) 713; (50) U.S.D.A. 424.
 from kelp, kelpchar as by-product, (47) 410.
 from lake brines, (41) 818.
 from leucite, (50) 324.
 from minerals, fertilizing value, (42) 430, 625.
 from sea water, (41) 723.
 from seaweed in California, (50) 123.
 from sunflowers, (41) 818.
 from various sources, (41) 518.
 from waste molasses, (50) 324.
 from wood ashes, (42) 522; (43) 324.
 from wool scouring wastes, (47) 324.
 German v. American, (43) Ind. 325.
 in mixed fertilizers, determination, (50) 412.
 in South Africa, sources, (45) 122.
 in Texas lakes, (43) 127.
 industry, Alsatian, (50) 324.
 industry, American, problems, (45) 121.
 industry in 1919, (44) 514.

Potash—Continued.

industry in United States, (42) 20, 220, U.S.D.A. 329.
 industry, progress in 1917 and 1918, (42) 329.
 industry, waste products from, contamination of rivers, (42) 719.
 lime, fertilizing value, (41) 724; (42) 221; (44) 422.
 manufacture in America, (47) 622.
 methods of separation from Chilean nitrate, (43) 25.
 mining, salt petrography in, (44) 322.
 Nebraska, retail prices, (42) U.S.D.A. 331.
 need and use by plants, (46) 224.
 occurrence and use, treatise, (48) 24.
 of soil and greensand, utilizing through soy beans, (41) N.J. 24.
 of soil, solubility in salt solutions, (41) 126.
 omission on grass crops, (41) N.Y. Cornell 21.
 omission on meadows, (41) Mass. 21.
 production, (42) 20; (44) 627.
 production—
 and prices in Germany, (42) 815.
 and sale, (42) 19.
 and use in 1918, (43) 26.
 in Alsace, (41) 325, 426.
 in Germany during war, (41) 519.
 in Russia, (41) 818.
 in United States, (41) 219, 325, 426, 518, 628; (44) 130; (50) 727.
 in United States during the war, (43) 728.
 requirements of potatoes, (41) Fla. 527; (44) 636.
 requirements of soil as shown by plant analysis, (44) 816.
 residual effect, (41) N.C. 625.
 residual in fertilized soils, (44) Pa. 717.
 resources of Italy, (43) 728.
 resources of Nebraska, (44) 724.
 resources of United States, (45) 816; (49) 124.
 rock, fertilizing value, (42) 430.
 shales of Illinois, (45) Ill. 120; (46) 626.
 soil, effect of lime, (42) Mich. 330, 524.
 soil, factors affecting availability, (43) Md. 121.
 sources and methods of separation, (45) U.S.D.A. 729.
 sources and use, (42) 525; (49) 517.
 sources in Prussia, (44) 815.
 sources in western Australia, (42) 723.
 storage and handling, (45) 25.
 studies, (49) Oreg. 510, 623.
 treatise, (50) 724.
 Trona, fertilizing value, S.C. (43) 126; (46) 717.
 use on moor soils, (41) 519.

Potash—Continued.

- water-soluble, in wood ashes, (44) 804.
- world's supply, (41) 24; (44) 424.

Potassium—

- absorption as affected by fertilizers, (47) Calif. 625.
- ammonium nitrate—
 - action and use, (43) 125.
 - composition and action, (46) 820.
 - fertilizing value, (41) 424, 627; (42) 624; (43) 221; (44) 318; (45) 330; (47) 322, 419; (49) 20, 623.
 - transformation in soil, (45) 424.
- arsenite, toxic dose for dogs, (49) 381.
- assimilation by corn, (45) 628.
- availability—
 - effect of greensand and sulphur composts, (48) 724.
 - effect of liming, (46) 24.
 - effect of soil bacteria, (49) Ky. 516.
 - in finely ground shale, (45) Ill. 121.
- carbonate, fertilizing value, (43) 23; (45) 23.
- chlorate as standardizing substance, (43) 12.
- chlorid and sulphate, comparison, (50) 624.
- chlorid, effect on—
 - composition of soil extracts, (43) Mich. 124.
 - lime requirements of soil, (44) Pa. 723.
 - nitrate accumulation, (44) N.Y. Cornell 818.
 - seed germination, (44) Va. 722.
 - soil permeability, (47) 20.
 - soils, (44) N.Y. Cornell 817; (50) 621.
- chlorid, feeding experiments, (49) Iowa 773.
- chlorid, fertilizing value, (43) Wis. 336; (45) Ohio 23, Ohio 119, Ohio 232, Ohio 233; (49) 623, Ohio 724, 825.
- chlorid, separation of magnesium from, (44) 112.
- chlorid works, effluent from, as fertilizer, (41) 629.
- chromate, effect on barley, (48) 323.
- compounds, comparison, (45) 521.
- cyanid—
 - as source of nitrogen, (44) 216.
 - effect on protozoan content of filters, (47) 92.
 - injection, effects, (48) 557.
 - insecticidal value, (48) Ky. 356; (49) 451.
 - use against pocket gophers, (50) Minn. 153.
 - use against subsoil nematodes, (43) 47.
 - use for fumigation of oranges, (43) 54.
 - v. hydrocyanic acid, (50) 151.

Potassium—Continued.

- determination, (43) 112, 803; (47) 804; (48) 204.
- determination—
 - in blood, (42) 506; (46) 416.
 - in feces, (46) 417.
 - in soil, use of silica crucibles, (46) 805.
 - in urine, (46) 417.
- dichromate, preservation of milk with, (47) 184.
- distribution in human blood, (48) 361.
- effect on—
 - cereals, (48) R.I. 518.
 - grapes and wine quality, (50) 644.
 - meadows, (50) 434.
 - nitrogen in legumes, (46) 120.
 - potatoes, (50) 235.
- exchangeable, importance for plant nutrition, (48) 214.
- ferricyanid, examination, (44) 9.
- fertilizers—
 - comparison, (50) 818.
 - effect on ammonification and nitrification, (50) 818.
 - effect on barley, (49) 631.
 - effect on quality of potatoes, (46) 440.
- fluorid, effect on wheat, (48) 324.
- hydroxid solution, alcoholic, preparation, (46) 614.
- in acid-insoluble silicates, determination, (48) 710.
- in animal nutrition, (49) 464, 568.
- in blood plasma, determination, (50) 615.
- in human milk, racial variations, (50) 562.
- in marsh soils, (43) 22.
- in orthoclase, availability, (44) 729; (49) Pa. 215; (50) 19.
- in rain water, (49) 413.
- in serum, determination, (45) 507.
- in soil, changes in, (48) Fla. 215.
- in soils of Greece, (47) 121.
- increasing applications, tests, (48) 520.
- iodid, effect on sporotrichosis, (41) 781.
- iodid, fertilizing value, (42) 222.
- iodid for goiter and hairlessness, (46) Mont. 374.
- iodid for goiter prevention, (50) Can. 371.
- iodid for invert sugar determination, (43) 314.
- iodid for malnutrition in pigs, (42) 679.
- magnesium sulphate, fertilizing value, (43) 126; (45) 521; (49) 623.
- magnesium sulphate for moor soils, (44) 515.
- magnesium sulphate, value for potatoes, (46) 425.
- mercuric iodid, germicidal value, (44) 275.
- movement in soils, (41) 214.

Potassium—Continued.

- muriate, retail prices, (42) U.S.D.A. 331.
- nitrate—
 - deposits of Oregon, (41) 817.
 - determination of chlorates in, (41) 803.
 - effect on composition of crops, (41) 422.
 - effect on molds, (45) 463.
 - fertilizing value, (45) 23; (49) 815.
 - in Cape Colony, analyses, (42) 430.
 - in Guatemala, (42) 219.
 - manufacture, new method, (42) 521.
 - preparation, (43) 126.
 - production in Chile, (43) 25.
- nitrogen, ratio of red clover, (47) 530.
- oxalate, effect on copper reducing power of sugars, (49) 716.
- perchlorate method of determination, (45) 314; (50) 507.
- permanganate—
 - effect on nitrogen determination, (44) 804.
 - for grape Oidium control, (50) 451.
 - for lactose determination, (45) 12, 615.
 - solution, effect on bud growth of cuttings, (49) 834.
 - use in nitrogen determination, (43) 116.
- persulphate, use in nitrogen determination, (49) 111.
- phosphate, antirachitic value, (46) 165, 473.
- phosphate, Schroeder's, fertilizing value, (49) 21.
- phosphates, fertilizing value, (45) 23.
- phthalate, acid, use in volumetric analyses, (42) 611.
- radioactivity of, relation to plant growth, (45) 428.
- relation to plant growth, (45) N.H. 337.
- removal from soil, (46) N.Y.Cornell 210; (47) Ky. 122.
- requirements of bacteria, (41) 523.
- rôle in cultivated plants, (47) 328.
- salts as soil amendments, (41) 326.
- salts, borax in, (42) U.S.D.A. 816.
- salts, control of importation, congressional hearings on, (43) 26.
- salts, effect on—
 - acid soil, (46) 520.
 - calcium, (42) Calif. 811.
 - Dactylis glomerata, (44) 222.
 - orange trees, (50) Calif. 327.
 - soil acidity, (47) R.I. 519.
 - soil moisture, (46) 627.
 - soil solubility, (41) Mich. 512.

Potassium—Continued.

- salts, effect on—continued.
 - soil structure, (41) 519; (43) 516; (44) 422.
 - salts—
 - fertilizing value, (43) 630; (44) 214; (45) 521.
 - in sugar beet sirup, (44) 116.
 - of Punjab Salt Range, (42) 430.
 - production in 1919, (42) 523.
 - refined, production in United States, (43) 26.
 - Stassfurt and Alsatian, composition, (48) 428.
 - value for different crops, (44) 515.
 - value on moor soils, (45) 624.
 - sodium as substitute for, (41) R.I. 426.
 - soil, as affected by gypsum, (47) 512.
 - soil, as affected by nitrification, (41) 324.
 - soil, as affected by sulfocification, (41) 324; (43) 517.
 - soil, liberation, (43) 127.
 - soil, utilization by intermediary crops, (43) 218.
 - sulphate—
 - and chlorid, comparison, (50) 624.
 - effect on nitrate accumulation, (44) N.Y.Cornell 818.
 - effect on peaches, (48) 139.
 - effect on seed germination, (44) Va. 721.
 - effect on soil reaction, (48) 216.
 - effect on soils, (44) N.Y.Cornell 817; (50) 621.
 - effect on solubility of calcium and magnesium, (47) 513.
 - fertilizing value, (42) 720, 721; (43) Tex. 37, 126, Wis. 336; (45) 23, 521; (47) 512; (49) Guam 427, 623, 825.
 - retail prices, (42) U.S.D.A. 331.
 - sprays, fertilizing value, Hawaii, (41) 138, 148.
 - value for potatoes, (46) 425.
 - supply of soil, Ohio, (45) 118; (47) 422.
 - thiocyanate, effect on plants, (46) 544.
 - thiocyanate for invert sugar determination, (43) 314.
 - volumetric determination, (45) 11.
- Potato—
- Alternaria, notes, (41) 347.
 - aphids, control, (41) Conn.State 158, 160, 162, 255, 756.
 - aphids, notes, (47) 52, Me. 159, 851.
 - aphids, pink and green, studies, (41) N.J. 255, Va.Truck 662.
 - aphids, soap sprays for, (45) Conn. State 148.
 - Association of America, proceedings, (50) 398.
 - Association of America, report, (48) 34; (49) 332.
 - bacterial rot, notes, (48) N.J. 345.
 - bacterial wilt, (42) 844.

Potato—Continued.

beetle, Colorado—

control, (41) 532, Wis. 661; (45) 40, 762; (47) Va.Truck 236; (49) Wis. 653.

effect of nicotin sulphate on, (45) U.S.D.A. 151.

in France, (48) 856.

in South Dakota, (43) 850.

life history and control, (50) 661.

notes, (41) Mont. 57, Fla. 548; (49) N.Mex. 534; (50) 758.

summary, (49) 658.

supposed poisonous qualities, (48) 358.

beetle, control, (45) Mich. 259; (47) Minn. 362.

beetle larvae, remedies, (41) 662.

beetle, 3-lined, notes, (41) Conn.State 159.

beetles, parasite of, (44) 255.

black rot, cause, (50) 243.

black rot, notes, (43) 243.

black scab, (46) 449, 743.

black scab in Netherlands, (46) 744.

black scurf, control, (45) Ind. 142; (48) Minn. 348.

black scurf, effect of soil temperature, (44) Wis. 241.

black scurf, notes, (43) 150; (47) Minn. 348.

black wart, biology, (50) 550.

black wart, notes, (45) 847.

blackheart, studies, (48) Calif. 542.

blackleg—

control, (44) Kans. 242.

etiology, (49) Nebr. 751.

notes, (43) 150, 245; (44) 447, 449, 644; (45) 48, Wis. 244, 354; (46) Can. 145, 741, 847; (47) Mich. 150, S.Dak. 448; (49) 46.

studies, (41) Can. 543; (48) 547.

viability of organism, (43) 654.

blight—

development, (44) 645.

early, notes, (43) 152; (45) 47; (46) 847; (47) S.Dak. 448, Calif. 646, 839; (49) 46.

in Jamaica, (47) 47.

infection from tomatoes, (47) 648.

blight, late—

amount of copper for control, (44) N.H. 50.

and weather, (50) N.J. 47.

bibliographical review, (49) 751.

comparison with tomato late blight, (43) 447.

control, (41) 51, Iowa 245, Can. 543, 545, 748; (42) 740; (43) 243; (45) Can. 841; (47) U.S. D.A. 448; (48) 646; (49) 247.

effect of temperature, (50) 41.

immunity to, (50) 350.

in Delaware, (50) 546.

Potato—Continued.

blight, late—continued.

insects as carriers, (48) 244.

notes, (41) 451; (42) 149, Hawaii 543, 740; (43) 44, 151, 152; (44) N.H. 245, 447, 846; (45) 47, 354; (46) Mass. 43, Can. 145, 543, 649, 847; (48) 242, N.J. 345, 842; (49) 44, 46, 843; (50) 550.

popular account, (44) Wash. 344.

spray v. dust for, (49) R.I. 544.

studies, (41) 748; (43) 547.

blight—

notes, (42) 742; (44) 48, 645; (45) 48, 842.

on tomato, (43) 154.

resistant varieties, Hawaii (41) 137; (46) 633.

sources of infection, (48) 846.

treatment, (41) 532.

blights, late, early, and bacterial, (41) Fla. 543.

blights, notes, (43) 150.

Botrytis disease, (44) 447.

bread, (42) 255.

brown fleck, internal, (41) 451.

brown ring, notes, (43) 243.

brown rot, description, (50) U.S.D.A. 46.

brown rot, notes, (45) 842.

brown streak, internal, cause, (44) Calif. 744.

calico and russet dwarf disease, (45) Idaho 240.

calico disease, transmission, (49) Idaho 241.

calico, transmission, (47) Idaho 749.

canker—

control, (45) 48, 749; (47) 47; (48) 245, 743; (49) 844.

notes, (46) 847; (48) 348; (50) 46.

resistance and reversion, (44) 447.

resistant varieties, (45) 145.

studies, (45) 353.

Cercospora disease, notes, (45) 145.

chips, manufacture, (47) U.S.D.A. 460.

clamps, decay in, (44) 447, 449.

collar fungus, (44) 447.

Conference, International, report, (47) 36.

corky scab, (47) 543.

crop, government estimation, (45) 40.

curl, notes, (46) 741.

curly dwarf, studies, (44) Minn. 745.

demonstrations in Ontario, (46) 242.

dextrose agar, H-ion concentration, (49) 821.

digger tests, (42) 186; (45) 186; (48) 287.

diggers, types, (44) 383.

disease in Holland, (46) 741.

disease, new, description, (47) Calif. 645.

disease survey in India, (46) 544.

Potato—Continued.

diseases—

- and pests in North Carolina, (41) 532.
- collected leaflets, (50) 550.
- control, (41) 51, Me. 143, 545, 748; (42) Hawaii 543, 743, Minn. 845; (44) 51, Ohio 151, Minn. 244, N.J. 341; (45) 354; (47) Oreg. 46, 47, Minn. 352; (48) 244; (49) 46, N.J. 148.
- control by fall plowing, (41) Kans. 41.
- control in England, (46) 241.
- effect of heat on seed, (45) 846; (46) 848.
- identification keys, (47) Oreg. 46.
- in Alberta, (49) 46.
- in America, (49) 751.
- in Argentina, (49) 843.
- in Belgium, (45) 650.
- in British Isles, (43) 245.
- in California, (45) 545.
- in Canada, (42) 246; (46) 847.
- in England and Wales, (48) 740; (49) 645.
- in France, (47) 46; (50) 447.
- in Germany, (45) 51.
- in Hawaii, (41) Hawaii 153.
- in Holland, (49) 753.
- in India, (50) 147.
- in Kansas, control, (50) 550.
- in Minnesota, (45) 40, 650.
- in Nebraska, (49) Nebr. 46.
- in Ontario, (42) 352.
- in Quebec, (48) 348.
- in South Africa, (50) 550.
- in Washington, (41) 656.
- little-known forms, (47) 543.
- loss due to, (49) 839.
- new or little known, (45) 545.
- notes, (41) 154, Ariz. 345; (42) 149, 541; (43) 45, 652; (44) 140, Conn.State 150, 244, Iowa 444, 447, 642, 748, Oreg. 841; (45) 630, 649, Can. 841; (46) Can. 145, (48) Can. 144; (50) 248, 550, Fla. 654.
- prevention and cure, (49) 544.
- studies, (41) Mich. 654, 655, 748; (44) Mont. 341; (46) N.J. 548, 844; (47) Idaho 749; (48) N.Dak. 44; (50) Minn. 143.
- dry rot, notes, (44) 447; (45) 40; (50) 147.
- eelworm disease, (42) 149.
- enterprise, analyzing, (47) 299.
- experimental and extension work of University of Nebraska, (45) 40.
- extract, effect on *Bacillus influenzae*, (48) 762.
- farms in New Jersey, studies, (42) 290.
- filosity, cause, (46) 744.
- fla beetle in South Dakota, (43) 850.

Potato—Continued.

- fla beetle, notes, (41) Conn.State 159; (42) 149, Mass. 356, N.J. 849; (48) N.J. 353; (49) Wis. 653.
- flour—
 - characteristics and detection, (41) 467.
 - manufacture, (47) 808.
 - mineral constituents, (45) 714.
 - use, (42) 255.
 - use in infant feeding, (49) 457.
- flowers, dropping of, (42) 148.
- "foot rot," studies, (41) 655.
- fungi, temperature relations, (42) 845.
- Fusarium—
 - blights in India, (50) 247.
 - diseases, studies, (41) Minn. 745; (46) Mont. 343, 847; (50) Mont. 143.
 - dry rot, notes, (44) 48.
 - injury, (44) 842.
 - rots, effect of temperature and humidity, (46) 146.
 - rots, notes, (42) 740.
 - tuber rot, (47) U.S.D.A. 448.
 - wilt, notes, (43) Ind. 345, 447; (45) 40, Ind. 143, N.Dak. 242; (47) Nebr. 752; (49) 46.
- grading law of Nebraska, (45) 40.
- heat rot or blackheart, chemical study, (50) 147.
- hopperburn, control, (43) 655; (45) Mich. 659; (50) Ohio 448.
- hopperburn, relation to leafhopper, (44) 645.
- hopperburn, studies, (47) Mich. 158.
- industry, relation of science to, (50) 398.
- industry, relation to U. S. Bureau of Markets, (45) 40.
- jelly end rot, notes, (47) S.Dak. 448.
- juice, diastase activity and starch content, (42) 228.
- juice extracted with acids, antiscorbutic value, (46) 359.
- juice, H-ion concentration, (42) 202.
- juice, saccharogenic actions, (42) 502.
- lanas disease, control, (48) 452.
- leaf crinkle disease, (47) 752.
- leaf curl—
 - cause and control, (46) 242.
 - demonstrations, (50) 350.
 - effect on yield, (49) 443, 752.
 - notes, (44) 447.
 - situation in Great Britain, (49) 752.
- leaf roll—
 - and allied diseases, (41) 451.
 - as affected by climate, (46) 242.
 - cause, (45) 544.
 - control, (44) 244; (46) 450; (50) N.Y.State 546.
 - correlation with tuber and sprout characteristics, (50) 147.
 - effect of mulching, (44) 845.
 - effect on tubers, (43) 546.

Potato—Continued.

leaf roll—continued.

- in Ireland, (49) 753; (50) 448.
- in Japan, (49) 544.
- notes, (41) 749; (42) Mass. 349, 740; (45) 48, 145, 354, Can. 841, 847; (46) Can. 145, 847; (47) Pa. 444, 751; (48) Can. 450; (49) 46, Idaho 745.
- organism associated with, (48) Mich. 644.
- relation to moisture, (49) Idaho 241.
- studies, (41) 51, 155, 247, 656; (43) 154; (44) Minn. 745, 845; (45) Me. 447; (46) 44, 147; (47) 47, 150, 543, 752.
- survey in Ontario, (45) 544.
- testing seed for, (50) 652.
- transmission, (47) Me. 160.

leafhopper—

- biohomics and control, (50) Iowa 154.
- control, (41) 662; (42) Minn. 848; (44) Wis. 249, 549; (45) Mich. 251, Wis. 552; (46) U.S.D.A. 153, 246, Ohio 749; (47) Iowa 255, Mich. 759; (48) Mich. 251, Mich. 355; (49) Wis. 653, Iowa 757; (50) Minn. 152, 755.
- curly dock as host, (46) Iowa 349.
- extract, effect of injection, (47) 850.
- injury from, (50) 653.
- life history, (44) 549; (45) 152; (47) Mich. 158; (48) Mich. 355; (50) 755.
- notes, (44) Iowa 452; (47) Wis. 452.
- relation to hopperburn, (44) 645; (46) Iowa 349; (50) Ohio 448.
- studies, (41) 847, 849; (43) 355, 655; (44) N.Y.State 352.

leak, notes, (50) 652.

maggot, notes, (47) 56; (49) 848.

mite, notes, (41) Hawaii 138.

mosaic—

- and related diseases, (47) 841.
- bibliographical account, (47) 752.
- control, (48) Ky. 146; (50) N.Y.State 546.
- crop loss due to, (49) Mich. 443.
- effect on yield, (45) 647; (49) 752.
- elimination, (49) Ky. 544.
- in Great Britain, (46) 848; (49) 752.
- in Ireland, (49) 753; (50) 448.
- in seed stock, (47) Mich. 648.
- insects as carriers, (49) Idaho 746.
- notes, (42) 349; (44) 150, 153; (45) 354, Can. 841; (46) 847; (47) 751, West.Wash. 898; (48) Can. 450; (49) 44, 46.

Potato—Continued.

mosaic—continued.

- relation to moisture, (49) Idaho 241.
- relation to running out, (46) Minn. 346.
- resistant strains, (47) Ga. 444.
- roguing and selection tests, (48) Can. 144.
- seed selection for, (45) 749, La. 749.
- studies, (41) 247; (44) Me. 449, Minn. 745, 845; (46) Can. 145.
- survey in Ontario, (45) 544.
- temperature relations, (49) Wis. 643.
- testing seed for, (50) 652.
- transmission, (42) 47, 250; (43) 546; (45) Me. 448; (47) Me. 160.
- virus, time and temperature of killing, (50) 652.
- moth grub, control, (48) 554.
- mottling disease, correlation with tuber and sprout characteristics, (50) 147.
- net-necrosis, notes, (45) 145.
- phloem necrosis, relation to mosaic disease, (44) 845.
- pink rot in England, (48) 146.
- pink rot, notes, (44) 447.
- pit rot, studies, (41) 749.
- plant juices, osmotic pressure, (50) 628.
- plants, absorption of copper by, (45) 733.
- pomace, utilization, (41) Me. 142.
- products as wheat substitute, (42) 255.
- proteins, supplementary value, (46) 161.
- pulp, feeding value, (42) 769.
- Rhizoctonia—
 - blight, notes, (50) 147.
 - control, (41) 153; (42) Minn. 845; (43) 547; (44) Wash. 646; (45) Idaho 240; (46) 844; (49) Idaho 746.
 - notes, (41) 451; (43) 47, 243, 652, Wash. 749; (47) Mich. 150, S. Dak. 448; (49) 46, Wash.Col. 241, Wash.Col. 247.
 - scab, notes, (45) N.Dak. 242.
- ring disease, notes, (42) 743; (44) 153; (50) 147.
- root knot, control, (50) Fla. 652.
- rose rust, notes, (44) 48.
- rosette, notes, (49) 843.
- rot due to cold, (46) 241.
- rot in storage, studies, (49) Tex. 442.
- rot, spraying experiments, (45) Can. 841.
- rot, treatment, (41) 545.
- russet dwarf disease, Idaho, (47) 749; (49) 745.
- rust in Costa Rica and Equador, (44) 747.
- rust, notes, (43) 346.

Potato—Continued.

- rust, origin, (45) 353.
- rust, survey, (44) 749.
- scab—
 - and soil type, (45) Mich. 650.
 - causes, (47) 47.
 - control, (41) 153, Iowa 247; (43) 532, 547, 751; (44) 344, Wash. 542, 646; (45) N.J. 51, Ind. 142, Wis. 448, Iowa 648; (46) 549, N.J. 549; (47) Mich. 150, N.J. 150, 248, 353, Calif. 646; (48) Minn. 348, N.J. 348, N.J. 349; (49) Va.Truck 348; (50) 653.
 - development as affected by soil temperature, (44) 646.
 - effect of soil reaction on growth, (48) 212.
 - in Britain, cause, (49) 646.
 - notes, (42) Minn. 845; (43) 243, 652; (44) 447; (45) 447, 842; (46) 44, 741, 847; (47) S.Dak. 448, Wis. 841; (48) N.J. 345; (49) Idaho 746, 843; (50) 147.
 - organism, nomenclature, (43) 655.
 - relation to hinding, (41) Mass. 21.
 - relation to soil acidity, (41) 123.
 - resistant varieties, (43) Vt. 153.
 - studies, (46) 450; (48) Can. 47, 743.
 - sulphur for, (46) 649.
- Sclerotial disease, (48) 245.
- scurf, control, (44) Kans. 242; (45) N.J. 51.
- seedlings, comparison, (49) Alaska 426.
- seedlings, description, (46) 834.
- seedlings, observations, (49) 529.
- shipments for 1919, (43) U.S.D.A. 595.
- shipping season 1920, summary, (45) 535.
- silver scurf, notes, (41) 748; (42) 740; (44) 447.
- skin spot, notes, (45) Wash. 243; (48) 245; (49) 44.
- skin spot, relation to powdery scab, (49) 47; (50) 653.
- sorting machines, tests, (50) 687.
- spindle tuber, notes, (49) 247; (50) Me. 350.
- spindling sprout, notes, (43) Md. 154; (45) 145; (46) 744; (49) 46.
- spraying demonstration areas, (50) 153.
- stalk disease, (44) 447.
- starch—
 - action of enzymes on, (41) 409.
 - digestibility, (47) 763.
 - manufacture, (42) 275.
 - manufacture, chemistry of, (44) 808.
 - manufacture, processes, (43) 808.
 - microphotograph of, (48) 708.
 - raw, digestibility, (43) 365.
- stem rot, notes, (45) 842.

Potato—Continued.

- storage rot fungi, respiration of, (45) 355.
- storage rots, studies, (45) 647; (50) 243.
- streak disease, studies, (45) 448; (50) 653.
- synonym committee, report, (50) 336.
- tambora disease, control, (44) 345; (50) 243.
- tipburn—
 - and sunscald, (49) 46.
 - artificial production, (46) 549.
 - control, (46) Ohio 749; (49) Iowa 747.
 - etiology, (46) 744.
 - in Maine, (50) 653.
 - notes, (46) 51, 847; (47) S.Dak. 448.
 - production and control, (45) 152.
 - relation to leafhopper, (44) 645; (46) Iowa 349; (50) Ohio 448.
 - studies, (43) Vt. 154, Ind. 345, 356; (47) 354, 759.
- tissue, intake of salts by, (44) 425.
- tops, feeding value, (49) 669.
- tops, poisoning of cows, (43) 180.
- tuber diseases, (45) 847; (50) U.S. D.A. 840.
- tuber rot under irrigation, (46) 146.
- tuber worm, notes, (42) Hawaii 543; (43) 52; (44) 653; (45) 551; (47) 847; (49) 53.
- tuber worm, parasite of, (47) 762.
- tubers—
 - bacterial vascular disease, (44) 542.
 - changes in composition during growth, (49) U.S.D.A. 247.
 - composition, (50) Minn. 135.
 - development, (45) U.S.D.A. 634.
 - frost necrosis of, (42) Wis. 148.
 - growth, (47) 536.
 - inner splitting of, (45) 145.
 - parasitism by *Pythium debaryanum*, (42) 449.
 - potential parasites of, (42) 246.
 - rate of desiccation, (43) 845.
 - skin spot disease, (42) 149.
 - vascular discoloration, (44) 646.
- Verticillium disease, (44) 447; (50) 449.
- violet root rot, (44) 447.
- warehouses, ventilation, (47) Mich. 892.
- wart—
 - anatomical studies, (49) 348.
 - and soil sterilization, (47) 544.
 - certification of immune varieties, (43) 47.
 - control, (47) Pa. 444; (49) 844.
 - distribution, (44) U.S.D.A. 154; (46) 242, 550.
 - distribution in Norway, (49) 645.
 - eradication, (44) U.S.D.A. 154.
 - European, notes, (46) 242.

Potato—Continued.

wart—continued.

- fungus, varietal and species hosts, (49) U.S.D.A. 443.
- history, (45) 544; (46) 550.
- immune varieties, (48) 146.
- immune varieties, adaptability and use, (49) U.S.D.A. 444.
- immunity, (46) 550.
- immunity, inheritance, (47) 544; (49) 753.
- immunity, nature of, (49) 753.
- immunity, stability, (49) U.S.D.A. 444.
- in England, control, (43) 348.
- in Europe, (46) 650.
- in Netherlands, (46) 450.
- in Pennsylvania, (46) 650; (47) 543.
- infested area, map, (47) Pa. 445.
- life history, (47) 248.
- notes, (43) 45, 245; (44) 245, 447, 448, 646; (45) 48; (48) 743; (49) 46.
- on tomato, (44) U.S.D.A. 154.
- origin, (48) 741.
- reaction of hybrids to, (48) 846.
- research aspects, (49) 753.
- resistant varieties, (42) 149; (43) 245; (44) U.S.D.A. 154; (45) 828; (46) 146; (47) 543.
- soil treatment for, (45) 146.
- studies, (42) U.S.D.A. 246; (45) 51, 650; (50) 653.
- tissue, catalase and pH in, (47) 354.
- varietal resistance, (50) Pa. 445.
- weevil, new, in Mississippi, (48) 852.
- wet rot, notes, (43) 243.
- wilt—
 - cause, (49) 648; (50) 243.
 - factors affecting, (49) Nebr. 147.
 - notes, (42) 742; (43) 547; (44) 842; (46) 847; (47) Pa. 444, S.Dak. 448; (49) 844.
 - studies, (44) Mont. 341; (49) Oreg. 539.
 - transmission, (45) 846.
- witches' broom, (49) 46.
- yellow dwarf in New York, (50) 653.
- yellow dwarf, notes, (50) 749.

Potatoes—

- abnormalities, (47) 327.
- absorption of water and nitrates, (49) 29.
- aerial fertilization with carbon dioxide, (41) Vt. 833.
- after alfalfa, fertilizer experiments, (46) N.J. 530.
- American Giant, situation in New York, (43) 531.
- analyses, (42) 438.
- aphids affecting, control, (43) Va. Truck 451.
- apparent growth after death of plants, (48) 439.

Potatoes—Continued.

- Armillaria mellea affecting, (44) 842; (49) 443.
- as affected by—
 - ammonium sulphate, (42) 219; (47) Mass. 218.
 - borax, (44) Me. 129, 423; (45) 426, 625; (46) 123, Conn.State 322; (47) N.H. 423, U.S.D.A. 521; (48) N.J. 325; (49) U.S.D.A. 324.
 - carbon dioxide, (42) 816; (44) 218, 725; (45) 345, 834.
 - copper sprays, (49) U.S.D.A. 247.
 - dolomagnesium, (44) 423.
 - drainage, (42) Wis. 384.
 - drought, (41) 347.
 - guanol, (44) 25.
 - neutral phosphate, (49) 517.
 - pepto-humic fertilizer, (44) 420.
 - potash, (45) 521; (49) 817.
 - potash and kainit, (44) 515.
 - potassium salts, (43) 630.
 - sodium arsenate, (47) 120.
 - sodium chloride, (43) 630.
 - soil disinfection, (42) 717.
 - sulphur, (50) Oreg. 724.
- as dry farm crop, Ariz. (41) 29; (43) 733.
- as intercrop for apples, (49) Mont. 136.
- as wheat substitute, (44) U.S.D.A. 761.
- ash constituents, (41) 502.
- assimilation of nutrients, relation to soil fertility, (50) 17.
- blast-furnace, potash for, (41) 629.
- boom for spraying, (42) Va.Truck 893.
- breeding, (41) 748; (44) 140, 632.
- breeding and selection, (47) 36.
- breeding, application of genetic principles, (49) 133.
- breeding experiments, (41) 134, 797; (42) 233; (45) 734, 822; (46) 533, 633; (47) S.C. 433; (48) Mich. 224, 434, 629, S.C. 629; (49) Oreg. 525, Can. 734; (50) S.C. 637.
- breeding for immunity, (48) 244.
- breeding, tools and technique, (47) 221.
- carbohydrates, effect of desiccation methods, (49) 10.
- carbohydrates in, (42) 202.
- certified and noncertified, comparison, (50) 637.
- changes after frost kills vines, (43) Md. 139.
- climatic requirements, (41) U.S.D.A. 417.
- commercial utilization, (46) 15.
- comparative studies, (50) 234.
- composition as affected by soils and fertilizers, (41) 422, 813.
- composition in relation to various factors, (41) 829.

Potatoes—Continued.

composition of tubers, skins, and sprouts, (44) 748.
 cooked v. raw for fattening pigs, (45) 377.
 cooking tests, (45) 532.
 cooperative marketing, (46) Minn. 290.
 copper absorption by, (46) 324.
 cost before and after the war, in France, (42) 593.
 cost of production, (41) N.Y.Cornell 233; (46) N.J. 590; (47) Mich. 135, Idaho 593; (49) N.Y.Cornell 691; (50) Can. 592.
 cost of production—
 in Colorado, (44) U.S.D.A. 789.
 in France, (50) 191.
 in New Jersey, (43) 532.
 in Westphalia, (47) 93.
 cost of spraying, (44) N.H. 245.
 cross-fertilization, technique, (43) 829.
 culture, (41) U.S.D.A. 829; (44) Alaska 328, Minn. 330, Minn. 331, 447, Alaska 522; (45) 630; (47) N.J. 230, Minn. 336, S.Dak. 434; (48) Mich. 531; (49) Alaska 491, Ohio 632; (50) 550.
 culture—
 as affected by temperature, (47) Iowa 229.
 direction for boys and girls, (44) U.S.D.A. 830.
 experiments, (41) Alaska 30, Alaska 31, Alaska 38, N.Mex. 139, Me. 142, 233, 333, 334, Minn. 387, Can. 528, Mich. 636, 638, Nebr. 638, 643, Utah 643, N.Dak. 735, 737, 738, N.Dak. 824; (42) 132, 229, N.Dak. 732; (43) 234, N.Mex. 332, Minn. 637, Mo. 740, Minn. 823, Minn. 824; (44) 436, Utah 525, 527, Ariz. 528, 632; (45) 34, N.Dak. 225, 532, 630, Can. 823; (46) 131, 533; (47) Mich. 129, Minn. 130; (48) Ky. 129, Hawaii 330, Ariz. 435, Can. 450, 630; (49) 34, 329, Oreg. 525, Oreg. 526, U.S.D.A. 630; (50) Minn. 133.
 German Research Institute for, (44) 436.
 handbook, (43) 829; (48) 337.
 in Australia, (49) 229.
 in British Columbia, (42) 733.
 in England, (46) 636.
 in Kansas, (50) 533.
 in Rhine Province, (45) 535.
 in South Africa, (41) 528.
 in United States, (44) 139.
 in western India, (50) 247.
 losses from poor seed, (43) 531.
 on moor soil, (44) 140.
 on peat soil, (43) 23; (46) 216; (48) 833.
 on sandy soils, (41) Wis. 18.
 relation to rose bushes, (47) Me.

Potatoes—Continued.

culture—continued.
 scientific research in, (46) 636.
 storage, and marketing in British Columbia, (46) 231.
 treatise, (47) 736.
 damage from various causes, (44) U.S. D.A. 118.
 decline in yielding power, (50) Mont. 135.
 degeneration, (43) Mont. 46; (44) 845; (45) 51, 447; (46) 126, 548; (47) 326, 525, 731, 752; (48) Colo. 546; (49) Idaho 751, 752, Nebr. 752, 822; (50) 46, 247, 345, 350.
 degeneration, causes, (47) 47; Minn. 336.
 degeneration, relation to depth of eyes, (43) 531.
 dehydrated, bacteria and molds in, (48) 60.
 depth of planting test, Minn. (44) 331; (47) 130.
 deterioration, (46) R.I. 227.
 digestibility coefficients, (48) 574.
 digestibility in stomach, (42) 862.
 disease-free, culture, (44) 542.
 dried, fat determination in, (43) 414.
 dry matter in, (42) 35.
 drying, (41) 15, 203, 557; (42) 417.
 drying and distilling, (44) 140.
 early, marketing, (49) U.S.D.A. 489.
 early, time of planting, (49) 97.
 effect of—
 Bordeaux mixture on plants, (43) 547.
 cold storage on seed value, (43) Md. 138.
 continuous culture, (49) Nebr. 733.
 deep cultivation, (44) 812.
 missing hills, (47) N.Y.State 134.
 new location, (43) Minn. 636.
 overfertilization, (47) 531.
 preceding crop, (49) Mont. 129, Oreg. 526, Nebr. 733.
 reduced oxygen on keeping quality, (43) N.H. 34.
 soil electrification, (43) Ky. 824.
 straw mulch and shading on degeneracy, (42) Minn. 824.
 time of digging, (48) N.J. 337.
 wounds on loss of weight, (42) 137; (44) N.H. 38.
 effect on blood regeneration, (44) 565.
 effect on following crop, (41) Del. 136, N.Dak. 823; (44) R.I. 33; (46) 336; (47) Wyo. 131; (49) Mont. 129, 231, Ohio 329, Ohio 724.
 effect on water extract of soil, (44) 719.
 electroculture experiments, (42) 136; (50) 131.
 European history, (49) 332.
 experiments in Germany, (48) 134.

Potatoes—Continued.

- experiments in Rhine Province, (47) 633.
- fall and winter care, (49) Mich. 844.
- Farina production from, (42) 211.
- feeding value, (50) 574.
- fertilizer experiments, (41) Mass. 21, Me. 131, Me. 142, 229, 233, 333, 334, Fla. 527, Can. 528, 638, 643, 815, N.Dak. 823; (42) 132, 223, 230, Conn.State 233, Mass. 326, Wis. 327, 329, 430, 515, 623, Minn. 825, Ohio 829; (43) 126, 231, 234, 532, Minn. 627, Can. 727, Minn. 824; (44) Hawaii 30, 128, 217, 317, 421, 436, Alaska 523, Conn.Storrs 529, 633, Fla. 635, 815; (45) 34, Ohio 126, Nebr. 531, 532, 631, Can. 817; (46) 131, 227, 425, 533, 633, S.C. 725; (47) Minn. 121, Wash. 124, Mich. 129, 229, Minn. 320, 321, Minn. 336, Wis. 418, 419, 531, R.I. 725, 726, Ark. 733, Nebr. 736, 815; (48) Can. 323, Minn. 331, N.J. 337, 520, 629, 630, Mo. 631, 721, 733; (49) 20, Wash.Col. 214, 329, Md. 333, Alaska 426, Oreg. 525, Can. 734, 825; (50) 235, 423, West. Wash. 520, Can. 533, 637, Can. 817.
- fertilizer experiments in India, (42) 517.
- fertilizers for, methods of applying, (49) Wis. 622.
- following alfalfa, (41) Nebr. 434; (44) U.S.D.A. 33.
- food value and uses, (42) 57.
- for fall seeding, (47) Ark. 734.
- freezing injury when undercooled, (45) U.S.D.A. 219.
- freezing point, determination, (45) U.S.D.A. 219.
- frost injury, (41) 843; (46) 241; (47) 749.
- fungus affecting, (42) Mass. 349.
- gases in intercellular spaces, composition, (45) 337.
- germination, fertilizer injury to, (50) N.J. 216.
- girdling experiments, (44) 436.
- grades, U.S.D.A. (43) 335; (48) 34.
- grades of Idaho, official, (47) 393.
- grades of North Dakota, (46) 134.
- grades, standard, (48) 631; (50) Mich. 437.
- grading and inspection, (43) N.C. 490.
- grafted on related plants, (47) 28.
- green manuring experiments, (41) Del. 136.
- Green Mountain, correlation of characters, (50) 633.
- greening studies, (45) Colo. 39.
- growth and accumulation of reserve material, (46) 25.
- growth in artificial light, (48) 26.
- growth in United Kingdom, composition, (41) 533.

Potatoes—Continued.

- handbook, (48) 229.
- harvesting, use of machinery in, (44) 383.
- hill selection experiments, (43) 527.
- hot composted manure for, (46) 818.
- hybrid, reaction to wart disease, (48) 846.
- hybridization studies, (46) 834, 835.
- immune to wart disease, inspection and certification, (49) 844.
- improvement by breeding, (47) 46.
- improvement by hill selection, (45) Utah 131.
- improvement, seed plat as factor in, (42) Mich. 694.
- industrial and commercial uses, (47) 36.
- inheritance of abnormal haulm type, (46) 126.
- insects affecting, (41) Me. 143; (43) 532, 652, 851; (44) 57, 140; (45) 656; (48) 650; (50) N.Y.State 555, Fla. 659.
- insulin in, (50) 767.
- internal browning, (44) Oreg. 840.
- iodin content, (43) 204, 632.
- irrigated and dry land, (45) 535.
- irrigation experiments, (41) N.Mex. 139, Nebr. 433, Nev. 728; (42) 576; (43) Utah 230, N.Mex. 332; (44) Oreg. 333; (45) Colo. 40; (48) Utah 284; (49) 34, N.Mex. 525; (50) Utah 135.
- labor expense of production, (45) 85.
- late, culture, (43) Mo. 740.
- late or main crop, culture, (41) U.S. D.A. 829.
- lessons on, (41) U.S.D.A. 197.
- lightning injury, (44) U.S.D.A. 121; (48) 543.
- liming experiments, (41) Mass. 21; (45) Ohio 126, Can. 817; (46) 131.
- line selection experiments, (44) 38.
- lining and loading cars, (42) U.S.D.A. 787.
- losses in transit and storage, (45) 849.
- macerated, source of peroxidase in guaiac reaction, (42) 505.
- main crop, marketing, (49) U.S.D.A. 793.
- Maine-grown, food value and mineral content, (41) Me. 142.
- manuring experiments, (41) N.Mex. 139; (42) Minn. 826; (43) 24, Utah 218, Minn. 627, Minn. 815; (44) Kans. 225; (45) Ohio 126.
- marketing methods, (42) Nebr. 35.
- maturity and yield trials, (50) 336.
- maturity trials, (46) 835.
- Mendelian characters, (44) 428.
- mineral constituents, (45) 714.
- mulching experiments, Nebr. (41) 434, 648.
- Nebraska, trade channels for, (45) 40.

Potatoes—Continued.

- nematodes affecting, (43) 243, 350; (45) 146.
- nickel and cobalt in, (49) 520.
- nitrogen in, (42) 35.
- nutrient requirement in sand cultures, (47) 626.
- on moor soils, potash for, (41) 519.
- organic nitrogen for, (50) S.C. 637.
- osmotic pressure in, (43) 131.
- parasitism of *Phoma* on, (44) Mass. 445.
- phloem necrosis in, occurrence and significance, (49) 646.
- planting—
 - and harvest dates, temperature influence on, (41) U.S.D.A. 716.
 - dates, (41) N.Dak. 735; (43) U.S.D.A. 435.
 - digging and sorting machines, (43) 188.
 - distances, (41) 642, N.Dak. 735; (43) Idaho 740.
 - harvesting, and sorting machines, (44) 189.
 - machinery in New York, (41) 487.
 - plat competition with, (48) 439.
 - potash tests with, (49) N.H. 329.
 - premature and wilting, (42) 148.
 - preparation for drying, (45) 416.
 - prices, Minn. (48) 688; (50) 193.
 - production in North America, textbook, (48) 795.
 - production in the South, (45) U.S.D.A. 234.
 - production, papers on, (49) U.S.D.A. 91.
 - production, trade, and foreign competition in, (49) 794.
 - project study outlines, (44) 596.
 - propagated vegetatively, selection in, (48) 27.
 - propagation, (47) R.I. 736.
 - propagation, methods, (44) 140.
 - protection from frost, (44) 811.
 - protection in Quebec, (43) 844.
 - quality, effect of fertilizers, (46) 440.
 - rate of manuring tests, (50) Minn. 120.
 - raw and dried, vitamin C in, (43) 765.
 - rejuvenation and improvement in France, (45) 432.
 - rest period, relation to available nitrogen, (50) 326.
 - rotation experiments, (41) Kans. 41, 229, Nebr. 433, R.I. 434, N.Dak. 823, N.Dak. 824; (42) U.S.D.A. 336, Minn. 825; (43) U.S.D.A. 435; (44) Del. 431, N.Dak. 524, Utah 525, U.S.D.A. 732, Oreg. 827; (45) Ohio 126, N.Dak. 216, R.I. 529, U.S.D.A. 530; (46) 131, U.S.D.A. 725, 819; (47) Minn. 121, Minn. 332, Alaska 527; (48) Minn. 321, 630; (49) Wash.Col. 214, Nebr. 328, Ohio 329, Wyo. 429; (50) N.Y.State 422.
 - rotations under irrigation, (45) 535.
 - rumors of dumping, (43) U.S.D.A. 794.

Potatoes—Continued.

- salt requirements, (46) N.J. 526.
- saprophytic fungi on, (42) 726.
- second generation of tubers in, (49) 229.
- seed—
 - as affected by irrigation, (47) Nebr. 735.
 - as affected by sprout production, (43) Md. 138.
 - certification, (41) N.H. 439; (43) 531; (44) 139, 447; (46) 33; (48) N.Dak. 44; (49) 332; (50) Conn.Storrs 32, S.C. 536.
 - certification in Nebraska, (49) 34.
 - comparison of stem end with seed end, (46) 231.
 - cooperative treatment, (47) 352, 353.
 - culture on peat soil, (45) 735.
 - degeneration, (49) Colo. 433.
 - eelworm-infected, treatment, (44) U.S.D.A. 449.
 - effect of size on yield, (45) 635; (47) Minn. 332, 633.
 - factors affecting yield, (45) 51.
 - for Connecticut, (46) Conn. Storrs 835.
 - from northern Ontario, (42) 634.
 - from northern sources, yields, (49) La. 824.
 - from sprayed vines, (47) Minn. 348.
 - from various sources, (48) S.C. 629; (49) Tex. 429.
 - greening and sprouting tests, (47) Mo. 35.
 - hot formaldehyde treatment, (46) Iowa 342.
 - importation, (50) 46.
 - improvement, (44) 38, N.Y.State 333, Mont. 336; (47) Oreg. 336; (49) 332.
 - industry in western Nebraska, (45) 40.
 - inspection, (43) 531.
 - irrigated, (44) Idaho 226.
 - irrigated v. dry-land, (43) Idaho 739.
 - maturity and size, (46) N.J. 530.
 - new, treatment, (50) 536.
 - northern v. home-grown, (41) Mo. 637.
 - planting date, (43) Ohio 740.
 - plat, (41) 247.
 - preparation, (43) Mich. 639; (44) 227.
 - produced under mulch, (41) Nebr. 434.
 - production, (45) Ind. 134; (47) S.C. 433; (49) Wash.Col. 223, U.S.D.A. 736; (50) Nebr. 335.
 - production in Maine, (43) 532.
 - production, irrigation as factor, (47) 36.
 - quality, (49) Mich. 97.
 - relation to diseases, (41) 545, 748.

Potatoes—Continued.

seed—continued.

- selection, (41) Hawaii 138, 336;
(42) 149, Ohio 449, Minn. 825;
(43) Wash. 798; (44) Mich.
195; (49) Md. 332.
- selection and care, (49) Okla. 529.
- size and source tests, (45) Colo.
39, Colo. 40; (46) 227.
- size of seed piece tests, (47) Mo.
35.
- sprouting tests, (44) 633.
- stock cut in storage, tests, (49)
133.
- stocks, comparison, (43) Ind. 339.
- storage experiments, (41) 439;
(45) Mo. 234; (47) Mo. 35,
Calif. 633.
- strain tests, (47) Wash.Col. 528.
- studies, (41) N.Dak. 735; (42)
Minn. 825; (45) 535; (50) Pa.
432.
- tests, (44) 533; (46) Mo. 332;
(47) 353; (50) 652.
- time of selection, (49) West.Wash.
898.
- time of soaking, (45) Mich. 241.
- treated v. untreated, (43) Minn.
637.
- treatment, (41) Iowa 38, 153,
Iowa 247, Mich. 654, N.Dak.
735, 749; (42) Minn. 845; (43)
547, Mich. 698, 732; (44) Kans.
242; (45) 28, Mich. 241; (46)
Iowa 342, 650; (47) 47, Mich.
129, Minn. 130, Mich. 149, Minn.
332, Minn. 352, Ariz. 543; (48)
N.Dak. 30, N.Dak. 224, 245,
Minn. 348; (49) 47; (50) Minn.
143, 654.
- treatment, effect, (47) 248; (49)
Wash.Col. 247.
- tubers, comparative test, (42)
138.
- variation in yield of halves of
same tuber, (47) N.Y.State 134.
- variety tests, (47) Mo. 35, 36.
- whole v. cut, (43) Idaho 739;
(47) N.Y.State 134, N.Y.State
135.
- yields as affected by source, (41)
642; (49) Tex. 429.
- yields as affected by treatment,
(48) Minn. 332.
- seeding experiments, (44) Hawaii 30,
R.I. 32, U.S.D.A. 432, N.Dak. 524;
(46) 131, Mont. 327, 533, 633; (48)
N.Dak. 225, Minn. 331; (49) Oreg.
526, U.S.D.A. 630, Nebr. 732, Can.
734, Idaho 736; (50) Can. 533.
- selection experiments, (44) 633.
- sodium for, (41) R.I. 426.
- solanin poisoning from, (43) 866;
(45) 862.
- sources of potash for, (50) 818.
- southern new, handling and loading,
(41) U.S.D.A. 337.

Potatoes—Continued.

- spacing experiments, (41) 642, N.Dak.
735; (44) N.Y.State 333; (46) 131;
(48) N.Dak. 225, Minn. 332.
- sprayed, growth and composition, (44)
749.
- spraying—
 - and dusting, (44) Mich. 144; (50)
Mass. 654.
 - boom for, (49) Wis. 653.
 - cooperative, (41) 545; (47) 353;
(48) 646.
 - efficiency factors in, (44) 51.
 - experiments, (41) N.J. 51, 57,
Me. 142, 247, Iowa 247, 532,
Can. 543, 656, Wis. 661, N.Dak.
735, 748, 749; (42) 48, 149,
Conn.State 246, 748; (43) 356,
447, N.C. 450, Va.Truck 451,
833, U.S.D.A. 843; (44) Minn.
245, Minn. 331, N.J. 341, Mont.
348, 436, 448, Mass. 453,
Minn. 745; (45) N.J. 50, Mich.
698, 847; (46) 241, N.J. 548,
Ohio 749; (47) Minn. 332,
Minn. 352, N.H. 448, N.C. 531,
Mich. 633; (48) Can. 144,
Minn. 332, N.J. 348; (49) Mo.
229, 247, N.H. 347; (50) U.S.
D.A. 32, N.J. 47, 350, Ohio 448.
in Netherlands, (44) 845.
- sprout production, relation to seed
value, (43) Md. 138.
- sprouting and greening, prevention,
(43) 436.
- sprouting in gas mixtures, (44) 519.
- starch in, (41) 233, 829; (42) 439;
(50) 313.
- statistics, (42) U.S.D.A. 731.
- steamed, feeding value, (41) Me. 142.
- sterility studies, (49) 332.
- stomatal behavior in, (49) 422.
- storage, (41) 439, Ill. 834; (42) N.H.
35; (43) 436, 830; (44) Ariz. 529;
(45) 39; (46) 533; (49) 332; (50)
147.
- storage—
 - and handling, (44) 140.
 - houses, (43) 829.
 - methods, (43) Ariz. 734.
 - rots, (45) 843.
 - winter, (48) 229.
- stored, rotting, in India, (44) 446.
- strains from other localities, (47)
Minn. 332.
- study of various characters, (47)
Minn. 336.
- sucrose formation in drying, (42) 211.
- sun-dried, vitamin content, (46) 359.
- synonymous varieties, (46) 730.
- tests, (48) 195; (49) 825.
- thinning experiments, (43) 531.
- time and rate of tuber growth, (41)
N.Dak. 735.
- time of applying manure, (46) 531.
- time of planting, (47) Mich. 129.
- transmission of characters, (41) 336.

Potatoes—Continued.

transposition tests, (41) Idaho 226.
tuber and sprout variations, relation to disease, (50) 652.
tuber diseases, control, (45) 447.
tubers within tubers, (41) 224.
use in starch manufacture, (44) 140.
varieties, (41) Idaho 226; (46) R.I. 226; (47) Alaska 530; (48) Nebr. 336; (49) Mont. 129.

varieties—

characteristics, (50) 237.
cooking test, (47) Alaska 527.
for Alaska, (44) Alaska 522.
for seed in Poland, (50) 439.
identification, (50) 831.
immune to wart disease, composition, (44) 449.
in Germany, (44) 140; (46) 231; (48) 229.
in Great Britain, (44) 436; (47) 827.
morphology and physiology, (47) 827.
permanence of, (49) 333.
reaction to wart disease, (47) 543.
response to fertilizers, (50) 234.
susceptible to hopperburn, (49) Iowa 757.
yields, (47) Alaska 527.

variety—

disease resistant, Wis. (45) 226, 448.
records, (45) 828.
testing, recent aspects, (49) 332.
tests, (41) Alaska 30, Alaska 31, Mass. 35, Alaska 38, Hawaii 137, Hawaii 138, Nev. 228, 229, Ariz. 332, 333, 334, Can. 528, Mich. 636, 638, 643, N.Dak. 734, 748, N.Dak. 824; (42) 35, 132, 531, Minn. 731, N.Dak. 732, Minn. 825, Minn. 826; (43) Tex. 34, Wyo. 135, Nev. 229, 232, 234, U.S.D.A. 330, N.Mex. 332, U.S.D.A. 435, La. 636, Minn. 636, Ariz. 734, Minn. 823; (44) Hawaii 30, R.I. 31, R.I. 32, 140, 227, Alaska 328, Alaska 329, Alaska 330, Minn. 330, U.S.D.A. 432, 436, Alaska 523, N.Dak. 524, Utah 525, Alaska 528, 632, 633, Oreg. 826; (45) 34, Colo. 39, N.Dak. 225, U.S.D.A. 530, Nebr. 531, 532, N.Dak. 734, 736, Can. 822, 828; (46) 131, 227, 531, 533, 633; (47) Minn. 130, Wyo. 131, 229, Minn. 332, Pa. 429, Alaska 527, Calif. 633, R.I. 736, Miss. 831; (48) N.Dak. 30, 31, 146, N.Dak. 225, Can. 227, Minn. 331, Minn. 332, 629, 630; (49) Va. 134, 232, 329, Alaska 426, Tex. 429, Wyo. 429, Oreg. 525, R.I. 526, U.S.D.A. 630, Idaho 732, Can. 734, Idaho 736, 825; (50) Minn. 133, Can. 533.

Potatoes—Continued.

variety—continued.

tests on different soils, (43) 439.
vitamin A in, (43) 165.
vitamin B in, (44) 261.
vitamin, water-soluble, in, (42) 759.
water requirements, (50) 828.
weeding experiments, (41) 737.
whole v. pressed, antiscorbutic value, (45) 568.
wild, habitat and growth, (46) 32.
wild, of Arizona, breeding experiments, (41) 134.
wilting caused by walnut trees, (48) 451.
wound cork formation in relation to seed piece decay, (43) 732.
yield as affected by—
late blight, (43) 44.
leafhopper control, (45) 152.
missing hills, (41) N.Y.State 336; (42) 234; (46) Mont. 327.
“place,” (41) 635.
previous crop, (42) Minn. 826.
time of harvest, (46) 231.
weather, (42) 418.

yield—

cycles, (41) 892.
relation to development of plant and size of seed, (45) Wyo. 431.
tests, field plot technique, (49) 332.
variation in plants from same tuber, (41) N.Y.State 337.
yields, (43) Ariz. 734; (44) N.Dak. 31; (49) Ky. 525.
yields, estimating, (44) 140; (50) 737.
yields, factors affecting, (48) N.Y.Cornell 33; (49) Can. 734.
yields in New Jersey, (46) 225.
zinc in, (42) 758.

Poteriostomum, notes, (44) 583.

Poudrette, fertilizing value, (41) 814.

Poultry—see also Chickens, Ducks, Fowls, Hens, etc.

acorns as food for, (42) 562.
animal concentrates for, (41) N.J. 75.
appliances and methods, (42) Md. 187.
appliances, description, (42) U.S.D.A. 187.
as economical producer of food, (45) 272.
atypical organisms in, (49) R.I. 81.
Black Orpington, utility of type, (43) 873.
botulinus poisoning, (43) 84.
bracken rhizomes for, (41) 271.
breed characteristics, (42) 671.
breeders, classified list, (43) Mont. 575.
breeders, selection without trap nests, (48) N.J. 272.
breeding, (47) 175, N.J. 476.
breeding—
age as factor, (48) Mo. 666.
as a business, (45) N.J. 877.
associations, (41) U.S.D.A. 675.
colony, (46) N.J. 574.
contest, (43) N.J. 468.

Poultry—Continued.

breeding—continued.

contest at Vineland, (43) N.J. 173.

contest in New York, (47) 176.

contests in New Jersey, (47) 176.

experiments, (42) Guam 65, 466; (43) Mich. 674; (48) 868; (49) Guam 471.

flock, selection and care, (48) West.Wash. 272.

flocks, raising males for, (49) 576, 599.

for egg production, (42) Mass. 872, 873, Kans. 873; (47) Ark. 779.

in North Africa, (42) 560.

pedigree, (42) Me. 68; (43) 675.

records, (50) Kans. 174.

stock, (44) U.S.D.A. 73, 796.

stock, selecting, (50) Mo. 873.

treatise, (46) 272.

breeds—

American, (45) 474.

characteristics, (50) 275.

comparison, (43) N.J. 173, Can. 776, Minn. 871.

egg production, (47) Miss. 276.

in Porto Rico, (47) 173.

power of organs of flight, (45) 775.

broodiness and its inheritance, (44) Mass. 870.

broodiness, effect and control, (43) N.J. 575.

broom corn seed for, (43) 671.

business, cost of starting, (42) Wash. 562.

buttermilk as source of minerals for, (49) 674.

Canadian record of performance "A," (48) 476.

canker, control, (44) Hawaii 83.

caponizing, (48) 273.

caponizing and killing, (42) 681.

capons v. cockerels, growth and feeding records, (43) Md. 574.

care and management, (41) N.J. 869; (42) N.J. 872; (44) U.S.D.A. 73; (48) 693.

care and management, manuals, (41) 676, 869.

care in health and disease, (49) 377.

care in summer, (45) N.J. 686.

castor bean meal for, (41) 281.

Chantecler, developing, (49) 171.

charcoal from walnut shells, (44) 117.

club work, outline, (47) 598.

clubs, formation, (42) 197.

cold storage holdings, U.S.D.A. (41) 66; (49) 893.

cold storage, treatment and cooking, (44) 61.

color and pigmentation in, (49) 574.

conditions in Philippines, (47) 873.

Poultry—Continued.

Congress, World's, notes, (44) 499; (49) 200; (50) 900.

cost and production, (47) Mich. 873.

cost of brooding, (49) Can. 70.

cottonseed-hull litter for, (41) 871.

course, required in agricultural curriculum, (49) 194.

craft, treatise, (50) 576.

crate feeding, (49) Can. 70.

culling, (42) U.S.D.A. 170, U.S.D.A.

268; (43) Wash. 496; (44) U.S.D.A.

73; (45) N.J. 378; (47) 377, Kans.

577; (48) 677; (49) 374, 674; (50)

Mo. 872.

culling—

and selecting, (48) 476.

catching coop for, (45) 474.

equipment, (43) Wash. 675.

factors, value, (49) N.J. 576.

demonstration crofts, (47) 377.

demonstration farm, (50) Mo. 890.

disease and feeding factor, (44) Wash. 95.

diseases, (42) Kans. 78, U.S.D.A. 180;

(44) U.S.D.A. 83, 881; (47) 87, N.J.

287, Calif. 684; (48) Ohio 193; (49)

178, U.S.D.A. 885.

diseases—*see also specific diseases.*

and ailments, (49) N.C. 787.

and parasites, control, (48) Calif. 780.

and remedies, (47) 286.

and vices, control, (47) Md. 73.

distribution and prevalence, (46) N.J. 584.

handbook, (48) 382.

in Netherlands, treatment, (50) 82.

in New Jersey, (41) N.J. 88.

relation to vitamins, (50) N.J. 383.

sour milk treatment, (42) Calif. 887.

summary, (45) Wash. 183; (50) Nebr. 185.

treatise, (46) 276; (48) 183.

dressed, bacteriology, (41) Kans. 77.

dressing and edible percentages, (50) 473.

effect of velvet bean meal, (47) 871.

egg-laying qualities, effect of breeding, (50) 600.

exhibitions, advantages, (49) N.J. 777.

experiment station in Italy, (47) 195.

experiments, (47) N.Mex. 475, N.C. 577; (49) Can. 69, Okla. 470, Idaho

777, Iowa 777; (50) Can. 272, Can.

273, Can. 372, Can. 777, Can. 778.

experiments, standardization, (50) 576.

exports from South Africa, (43) 676.

farm, improvement, (41) Kans. 76.

farm, initial capital required, (43) 94.

farm survey, (49) 593.

farming in New Jersey, N.J. (41) 75; (50) 90.

Poultry—Continued.

- farming, profits, (45) Can. 877.
- farms in Missouri, profits, (44) 269.
- fattening, (44) Wash. 73; (47) 872, Okla. 872; (49) 71.
- feed, estimation of grit in, (50) Mich. 715.
- feeder and watering stand, (46) Ohio 782.
- feeding, (43) Wash. 798; (47) 377, Calif. 576; (48) 574.
- feeding—
 - and fattening for market, (42) 268.
 - and feeds, treatise, (48) 768.
 - and marketing the broilers, (49) Ohio 673.
 - commercial v. home mixture, (50) Can. 471.
 - experiments, (43) N.Mex. 378, Can. 776; (45) Guam 70, Ind. 172, Mo. 272, Can. 876; (46) Iowa 363, Mo. 370, U.S.D.A. 531, Calif. 576, 770; (47) Md. 73, 275, Wis. 468; (48) 75, W.Va. 72, N.J. 373, 472, Calif. 572, Mo. 666; (49) 171, 172, Ind. 573, Ky. 574, N.Mex. 574, Wis. 672; (50) 871.
 - for egg production, (43) 174.
 - meat v. no meat, (45) 71.
 - principles of, (44) Mont. 269.
 - standard scratch ration, (48) N.J. 76.
 - winter, (47) 671.
 - with red ant pupae, (50) 576.
- feeds—
 - analyses, (41) N.H. 68, Conn. State 176, Ind. 564, R.I. 564, Can. 565, Ind. 868, N.Y.State 868; (42) Mich. 63, 263, Ind. 769, N.H. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, N.J. 672, R.I. 672, Ind. 876; (44) Mich. 568, Mass. 671, N.H. 671; (45) N.Y.State 469, N.J. 775, 872, R.I. 872; (46) Can. 168, Mich. 168; (47) N.Y.State 172, Mass. 274, 275, Ind. 473, Conn. State 570, N.J. 571, R.I. 571, 668; (48) 68, Me. 68, Can. 368.
 - and feeding, (41) Can. 370.
 - Australian, analyses, (41) 868.
 - composition, (41) U.S.D.A. 869.
 - composition and digestibility, (44) Wash. 269; (47) Calif. 576.
 - composition and retail price, Conn.State (44) 176; (45) 375; (47) 570.
 - digestibility, (48) 573; (50) N.C. 274.
 - grit in, (41) 564.
 - Mexican insects in, (43) 53.
 - mineral content, (45) N.C. 70.

Poultry—Continued.

- feeds—continued.
 - palatability, (43) Nebr. 675.
 - potential acidity or alkalinity, (43) 573; (44) 473; (45) N.C. 70.
 - protein sources, (43) Okla. 73.
 - xanthophyll in, (44) 71.
- finishing in packing house, (47) U.S. D.A. 74.
- finishing, method of teaching, (43) 898.
- for exhibition, standard, (46) 875.
- frozen fish for, (43) Minn. 674.
- genetic studies, (46) 272; (48) 471.
- genetics in crossing of, (45) 377.
- grading experiment, (43) N.C. 467.
- greening during storage, (47) 673.
- guide, (47) 671.
- home doctoring, (47) 483.
- houses—
 - adaptable, and equipment, (48) Ohio 685.
 - and fixtures, plans, (42) 285, 286.
 - artificial illumination, (44) N.J. 269.
 - brooder, (47) Md. 73, 91.
 - brooder, open front, (45) Wash. 84.
 - colony brooder, (49) Mo. 288.
 - colony brooder, portable, (49) 287, 288.
 - colony, brooder with coal stove for heating, (45) 71.
 - colony, care, (43) N.J. 174.
 - concrete, construction, (43) 90.
 - construction, (42) U.S.D.A. 187; (44) 689; (45) Ind. 186, Oreg. 491; (46) Mont. 693; (50) 486, Oreg. 486.
 - construction in France, (42) 590.
 - equipment, (43) Wash. 392; (46) N.J. 189.
 - fool-proof, (50) Mo. 888.
 - for Indiana, (48) 198.
 - for Kansas, (47) 688.
 - for Kentucky, (46) 385.
 - for Maine, (47) 191.
 - for Michigan, (47) Mich. 688.
 - for Missouri, (46) 385.
 - for Ohio, (46) 386.
 - for Oklahoma, (42) 687.
 - for Pennsylvania, (47) 793.
 - for pullets, construction, (49) West.Wash. 87.
 - lighting, (48) 667.
 - multiple unit laying, (43) N.J. 893.
 - of northwest station, (47) Minn. 392.
 - Ohio multiple-unit, (48) 591.
 - open-air range, (50) Oreg. 888.
 - Oregon Agricultural College portable colony, (50) Oreg. 590.

Poultry—Continued.

houses—continued.

- plans, (43) 676, Mo. 790, Ind. 892; (44) U.S.D.A. 87, 588; (45) 84; (46) Wis. 288; (47) Md. 73, 688, N.J. 688; (48) N.J. 685.
- plans and specifications, (48) 386; (49) N.J. 388.
- standard, (43) N.J. 188.
- ventilation, (50) 689.
- wet litter in, (50) 780.

- housing, (41) Wash. 292, N.J. 385, 488.
- housing and feeding in Rhodesia, (47) 873.

- husbandry courses, (45) 93; (48) 496.
- husbandry in high schools, (41) 396.
- husbandry, textbook, (41) 597; (46) 95.

- improvement, Missouri plan, (46) 72.

- in Mauritius, (42) 671.

- inadequate rations, effect on production and hatchability of eggs, (49) Tex. 470.

- inbreeding effects, (47) Wis. 476.

industry—

- economic position, (44) 572.
- importance to Ireland, (45) 378.
- in Netherlands, (46) 875.
- of Orkney Islands, (43) 174.

- infected with *Bacillus botulinus*, remedy, (49) Oreg. 582.

inheritance—

- in, (49) 674; (50) 128.
- of egg characters, (43) N.Y. Cornell 872.
- of spangling in, (50) 528.
- studies, (49) R.I. 575.

- Institute in Great Britain, National, (47) 900.

- instruction in England and Wales, (44) 596.

- intestinal roundworms in, (49) West. Wash. 395.

- judging for boys' and girls' clubs, (48) 297.

- judging for egg production, (50) 373.

- Lamona, new breed, (45) 377.

- large and small breeds, cause, (50) 429.

- lethal gene in, (50) 731.

- lice and mites, control, (45) Mont. 586.

- lice, exterminating, (47) Wash. 186.

- lice in Colorado, (43) 660.

- lice, mites, and cleanliness, (42) U.S.D.A. 180.

- linkage in, (46) 769.

- live, market before and after the war, (44) 871.

- longevity and constitutional vigor, (50) 872.

- management, (47) Ind. 175.

- management and selection for exhibition, (48) N.J. 273.

- management at New Hampshire College, (48) 476.

Poultry—Continued.

- management, record keeping, (41) N.J. 77.

- manure, analyses and use, (42) Can. 520.

- manure, preservation and use, (48) 621.

- manure, storage shed for, (47) Md. 73.

- market prices in New York, (41) N.J. 75.

- marketing, (48) Calif. 573; (50) U.S.D.A. 873.

- mating, methods, (46) N.J. 369; (50) Can. 471.

- maturity, factors affecting, (43) Nebr. 675.

- meat production, (49) N.J. 273.

- metabolism and respiratory exchange during vitamin starvation, N.Y. State, (47) 465, 577.

- methods of driving, (47) Md. 73.

- mineral supplements for, (44) Ohio 175.

- mites, control, (45) Ind. 149, Mont. 586.

- monstrosities, (44) 174.

- moulting, relation to egg production, (47) West. Wash. 577.

- new races, hybrids in, (48) 476.

- normal temperature, (49) 471.

- nutrition studies, (42) Wis. 375.

- nutritional disease, (44) Calif. 782; (45) 680; (48) Calif. 579.

- parasites, (41) N.J. 192, 286; (47) 483, West. Wash. 885.

parasites—

- control, (42) Mass. 873; (43) N.J. 787.

- external, (45) Mich. 899.

- in Canada, (48) 883.

- nicotin for, (49) 684.

- transmission, (43) 378.

- pathogenic cestode in, (48) 183.

- pathological conditions peculiar to, (49) 377.

- pedigree work, (47) 75.

- pelvic wing in, (44) 668.

- pest, new, (49) 848.

- pests, sulphur dioxide for, (47) 156.

- plant, organizing, (50) N.J. 73.

- plant, sanitary practices, (46) N.J. 678.

- post-mortem examination, (47) West. Wash. 487.

- potassium nitrate poisoning in, (48) 381.

- preparation for exhibition, (44) U.S.D.A. 473.

- products, marketing, cooperation in, (50) 294.

- products, price variations, (44) N.J. 369.

- products, use, (42) U.S.D.A. 254.

- progeny tests, (45) 173.

- prolapse in, (45) Wash. 483.

Poultry—Continued.

- protective feeds for, (41) N.J. 76.
- proteins for, (49) 273.
- purebred, record of performance, (46) 770.
- raising, (43) U.S.D.A. 468; (47) 377; (49) 373.
- raising—
 - for boys and girls, (46) 598.
 - in Alberta, (45) 474.
 - in Argentina, treatise, (49) 171.
 - in Canada, manual, (43) 676.
 - in China, (46) 573.
 - in cities, (42) Mass. 69, 268; (46) 273; (49) U.S.D.A. 777.
 - in Federated Malay States, (45) 71.
 - in Florida, (50) 375.
 - in Maine, (43) 676.
 - in Porto Rico, (44) 871; (46) P.R. 370.
 - in South Carolina, (48) 476.
 - instruction in, (49) 96.
 - on fruit plantations, (45) 378.
 - on intensive system, (48) 272.
 - project study outlines, (44) 596.
 - relation to insects, (44) 162.
 - returns from, (49) Mich. 489.
 - treatise, (42) 268, 471; (43) 174, 494; (46) 768; (47) 496; (48) 373; (49) 273; (50) 676, 779.
- ranch, planning, (50) West.Wash. 175.
- range, care, (43) N.J. 174.
- rate of growth, (50) Mo. 467.
- rate of senescence and decline of egg production, (50) 577.
- rations, balancing, (44) Wash. 269.
- rations for crate fattening, (50) 373.
- rations, simple v. complex, (42) Mich. 670.
- rats as enemy, combating, (47) West. Wash. 549.
- records and accounts, (44) N.J. 675.
- research in Great Britain, (49) 398.
- Rhode Island Reds, breeding, (47) Iowa 577.
- scoring exhibits in, (50) 195.
- selecting breeding males for egg production, (50) Mass. 72.
- selection experiments, (43) Nebr. 675.
- septicemic disease of, (49) 81.
- sex characters, secondary, (44) 468.
- sex control in, (49) 864.
- sex-linked inheritance in, (46) Mo. 370.
- short course, methods of teaching, (50) 195.
- standards for growth and production, (41) N.J. 75.
- sticking, physiology of, (47) 869.
- sunflower silage for, (43) Minn. 674.
- synthetic Mendelian forms in, (48) 468.
- system of pedigree work, (46) 876.
- tapeworms, notes, (44) 379.
- teaching, problem method, (48) 497.

Poultry—Continued.

- transmission of hog cholera by, (50) 382.
- trap nest, construction, (48) Oreg. 889.
- trap nesting, (48) West.Wash. 273.
- use of damaged wheat, (42) Md. 170.
- vermifuges for, (43) Okla. 79.
- vitamin deficiency in, (50) 871.
- weights, coefficient of variability, (50) 872.
- weights, relation to weight and number of eggs, (50) W.Va. 675.
- White Leghorn, inheritance of fecundity in, (49) 273.
- winter handling, (46) Wash. 397.
- work in Palestine, (47) 700.
- wrapping heads for market, (42) U.S.D.A. 376.
- Wyandotte, standard and breed book, (45) 877.
- yard sanitation, (46) Wash. 297.
- yards, green crops in, value, (46) N.J. 574.
- yards, planning and construction, (47) 391.
- yards, soil contamination, (43) 378; (48) West.Wash. 477.
- Poultrymen, daily schedule for, (50) West. Wash. 175.
- Powdery mildew, *see special hosts*.
- Powell, G. H., memorial, (48) 798; (49) 37.
- Power—
 - farming and subsoiling demonstration, (47) 391.
 - on the farm, (43) 591.
 - transmission belts, (43) 285, 790.
- Prairie—
 - and woodland, ecotone between, studies, (45) 221.
 - dog, antiscorbutic requirement, (44) 863.
 - grass hay, nutritional studies, (48) N.Dak. 69.
 - grass, toxic limit of alkali for, (49) 513.
 - hay, feeding value, (41) 772; (42) Tex. 369.
 - inclusions in deciduous forests, cause, (47) 442.
 - plants, subterranean anatomy, (43) 130.
 - rice, culture, (43) U.S.D.A. 139.
 - soils, mountain, fertilizer requirements, (41) 722.
 - soils, nature of burn-outs, (48) 423.
 - subsoils, moisture content and hygroscopic coefficient, (41) 514.
- Prairies—
 - cause of treelessness, (45) 839.
 - chemical fertilizers on, (50) 322.
 - of Canada, tree planting on, (46) 843; (48) 640.
 - of Iowa, nursery belts in, establishment, (48) 448.
- Praon simulans, larval stages, (49) 559.

- Prawns, vitamin A in, (47) 662.
- Precipitates, rate of settling, (44) 807.
- Precipitation—*see also* Rainfall, Snowfall, *etc.*
 altitude relation, (44) U.S.D.A. 716.
 and evaporation of the earth, (47) 615.
 and humidity, (49) U.S.D.A. 313.
 and sunspots in Japan, correlation, (47) 616.
 annual, of northern Great Plains, (44) U.S.D.A. 141.
 charts of Montana, (44) 209.
 forecasting, (44) U.S.D.A. 715.
 in California, (43) 618.
 in Canada, (44) 810.
 in forests, (42) 117.
 in Japan, effect of topography on, (42) 418.
 loss by rainfall interception, (42) U.S.D.A. 317.
 mackerel sky as prognostic, (43) U.S.D.A. 511.
 normal, in Utah, (42) U.S.D.A. 319.
 on forested and unforested soils, (44) 418.
 relation to grain yields, (41) Nebr. 37.
 relation to run-off and evaporation, (42) 419.
 relation to wheat yield, (42) 617.
 relation to wind direction, (42) U.S.D.A. 320.
 relation to winter wheat, (41) U.S.D.A. 810.
 seasonal distribution, (42) U.S.D.A. 318.
 stations for predicting stream discharge, (45) U.S.D.A. 722.
 test for tuberculosis diagnosis, (44) 681.
 under trees, (41) 315.
 variation with altitude, (41) U.S.D.A. 119.
- Precipitin test for detection of anthrax in animal carcasses, (45) 180.
- Precipitins, production, effect of vitamin deficiency, (49) 279.
- Pregnancy—
 and lactation, effect of vitamin deficiency, (50) 566.
 calcium in blood during, (49) 765.
 diagnosis, (41) 84.
 mammary gland development during, (41) 173, 174.
- Preissia, plastids and mitochondria in, (44) 221.
- Preisiz-Nocard bacillus—
 as cause of lymphangitis, (50) 81.
 immunological studies, (47) 788.
 in ovine pathology, (49) 80.
- Prenes spp., notes, (48) 357.
- Preservatives, quantities necessary to inhibit fermentation, (42) 608.
- Preserves—
 insoluble solids in, determination, (42) 415.
 pure fruit, apple juice in, (47) 807.
 recipes, (47) 113.
- Preserves—Continued.
 Turkish, manufacture in Asia Minor, (42) 417.
- Pressure—
 action on plant cells, (50) 23.
 cooker, use in the home, (46) 257.
 transmission through solids and soils, (47) 389.
- Pressures—
 developed in gaseous explosions, (48) 683.
 required for stomatal infections of citrus canker, (48) 744.
- Pretzels, energy content, (42) 660.
- Preventive medicine and hygiene, treatise, (46) 859.
- Pribilof Islands, biological survey of, (49) U.S.D.A. 652.
- Price fixing in England, (42) 592.
- Prices and wages in India, statistics, (42) 291.
- Prices, variations, effect on net results of farming, (47) 794.
- Prickly broom, feeding value, (42) 769.
- Prickly pear, *see* Cacti.
- Primost, use in candy making, (42) Wis. 316.
- Primroses, evening, insects affecting, (43) 556.
- Primula—
 breeding experiments, (42) 432.
 malacoides, variation in, (41) 635.
 variabilis, variations and fertility, (48) 330.
- Primulas, hardy and semihardy, list, (43) 240.
- Primulas, varieties, (41) 242.
- Prion vittatus, nomenclature, (42) 355.
- Prionini, life history notes, (42) 454.
- Prionoxystus robiniae, notes, (46) 750.
- Pristomarine, new, from California, (45) 258, 860.
- Privet cuttings, propagation in acid medium, (49) 836.
- Privet, swamp, olive-knot organism on, (47) Calif. 650.
- Privies, sanitary, practical types, (41) 587, 588, 791; (42) 788.
- Privies, types, relation to intestinal infections, (46) 588.
- Privy, portable, for field service, (41) 489.
- Privy system, can, disposal station, (42) 481.
- Probabilities, mathematical theory, treatise, (48) 97.
- Proctotrypid inquiline with Formica exsectoides, (42) 752.
- Proctotrypidae, parasites of flies, (42) 361.
- Prodecatoma phytophaga in grape seeds, (50) 851.
- Prodenia—
 eridania, notes, (43) 557.
 litura, notes, (43) 52; (49) 758.
 litura on maize, (41) 57.
 litura on rice, (46) 458.
 ornithogalli, notes, (44) Kans. 249.

Prodenia—Continued.

- sp. on sweet potato, (41) Fla. 548.
 spp., control, (49) V.I. 352.
 Producer gas as engine fuel, (50) 588.
 Productiveness, use of term, (42) 529.
 Productivity—
 age of greatest, as affected by re-
 stricted diet, (49) 766.
 use of term, (42) 529.
 Proflavin, antiseptic value, (41) 188; (43)
 79.
 Project method, limitations, (49) 492.
 Project work, local leadership in, (49) 596.
 Prolamin of wheat bran, analyses, (50) 711.
 Prolifkeeno grass, culture experiments,
 (41) Hawaii 138.
 Prolin, determination, (42) 201.
 Prolin, studies, (44) 462; (45) 864.
 Promachus spp. attacking white grubs,
 (42) 550.
 Promecothea opacicollis, notes, (41) 59.
 Promecothea reichii on coconut, (43) 52,
 851.
 Propachyneuronia siphonophorae, parasit-
 ism by, (44) Va. 756.
 Propagating frame, description, (46) 640.
 Prophanurus busseolae n.sp., description,
 (48) 59.
 Prophylactic vaccines, efficacy, (47) 484.
 Prophylaxis of animal diseases, treatise,
 (46) 579.
 Propysaon andersoni, studies, (44) Oreg.
 158.
 Propionic—
 acid fermentation, associative action
 in, (45) 779.
 acid production from lactose, (50) 109.
 fermentation of lactose, (50) 109, 205.
 Proprietary foods, analyses, (42) 162.
 Proprietary preparations, therapeutic, (43)
 470.
 Prothrinotermes, notes, (43) 256.
 Prosayleus phytolymus, notes, (43) 563.
 Prosema (Mochlosoma) lacertosa, parasite
 of white grubs, (42) 549.
 Proso—
 culture and uses, (44) U.S.D.A. 231.
 culture experiments, (47) U.S.D.A. 330.
 for fattening cattle, (44) S.Dak. 365.
 head smut, (47) Wash.Col. 541.
 millet stripe disease, (50) 550.
 new varieties for South Dakota, (42)
 S.Dak. 827.
 oil, composition, (42) 801.
 pollination, (48) 834.
 seed production, (48) N.Dak. 225.
 seeding experiments, (47) U.S.D.A. 330.
 variety tests, (47) U.S.D.A. 330; (48)
 N.Dak. 224.
 Prosol, use of term, (42) 801.
 Prosopis, root growth, oxygen response,
 (41) 132.
 Prosopis stepaniana, value in wheat and
 barley culture, (44) 232.
 Prospaltella berlesei, parasitism, (50) 459.

- Prosperity, national, factors affecting, (46)
 590.
 Protalbinic acid, gold number determina-
 tion, (43) 12.
 Protea cynaroides—
 bacterial leaf spot disease, (44) 644.
 bacteriolytic action in, (46) 44.
 Proteaceae, cyanophoric glucosids in flow-
 ers, (48) 432.
 Protein—
 analysis in feeding stuffs, (42) 210.
 analysis, modified method, (45) 614.
 and fat ratio in the diet, (41) 669.
 Bence-Jones', nitrogen distribution in,
 (48) 313.
 bodies, hydrolysis, (48) 802.
 bodies, origin, (47) 223.
 catabolism and fatigue, (44) 863.
 decomposition products, feeding value,
 (42) 469.
 deficiency and pellagra, (46) 762.
 deficiency cause of edema, (42) 557,
 865.
 deficiency, relation to disease, (45) 165.
 diet, excess, antidote to, (48) 861.
 diet, high, creatin coefficient, (48) 861.
 diets, high, nutrition on, (48) 860.
 diets in treatment of diabetes, (42)
 558.
 efficiency of different livestock feeds,
 (49) 369.
 excess, effect on milk secretion, (46)
 65.
 feeding, effect on infants, (41) 561.
 feeding, effect on offspring, (42) Mian.
 871.
 feeds for egg production, (47) Miss.
 73, Idaho 779, Idaho 870, 871.
 fever, studies, (42) 676.
 formation from urea by ruminants,
 (46) 67, 68.
 hydrolysates, action of furfural and
 dextrose on, (42) 210.
 hydrolylates, effect on growth of strepto-
 cocci and yeast, (48) 560.
 hydrolysis, methods, (42) 201.
 hydrolysis products, substitution for
 proteins, (48) 557.
 intake, relation to creatin excretion,
 (42) 367.
 metabolism—
 effect of high altitudes, (43) 565.
 of Filipinos, (41) 563.
 physiology, (46) 563.
 significance of creatin in, (45)
 262.
 milk, preparation and use, (44) 64.
 mixtures, metabolism experiments, (42)
 265.
 molecule, unidentified sulphur grouping
 in, (49) 501.
 requirements—
 dependence on mineral metabolism,
 (41) 558.
 of calves, (46) 764; (49) Pa. 274.

Protein—Continued.

- requirements—continued.
 - of children, (46) 756.
 - of cows, Vt. (48) 173, 668.
 - of heifers, (46) Mo. 371; (48) Nebr. 668.
 - of man, (42) 459.
- research, progress in, (48) 202.
- solutions, electrometric titration, (41) N.Y.State 201.
- storage in protoplasmic tissue, (48) Mo. 608.
- supplements for pigs, (47) Wash.Col. 575; (49) Pa. 271; (50) Miss. 69, Tex. 71, Pa. 469.
- supplements to corn, comparisons, (45) Ohio 676.
- synthesis by *Azotobacter*, (49) 626.
- therapy and nonspecific resistance, (49) 78.
- transformation into fat, (48) 161, 561.
- values of feeds and food materials, (48) 398.
- values, supplementary, in foods, (46) 161; (48) 262.

Proteins—

- absorption, studies, (43) 65.
- action of acids on, (42) 614.
- amino acid determinations, (49) 715.
- ammonia nitrogen determination in, (48) 11; (50) 713.
- and colloid chemistry, (44) 501.
- and pellagra, discussion, (50) 164.
- and theory of colloidal behavior, treatise, (49) 109.
- animal—
 - for growing chicks, (49) Nebr. 777.
 - for laying hens, (46) 875, Ky. 875; (50) Mont. 871.
 - role in nutrition, (41) 669.
 - v. vegetable for egg production, (43) 270.
 - v. vegetable for poultry, (49) Can. 70.
- calculation of isoelectric point, formulas, (49) 501.
- coagulable, determination in serum, (45) 14.
- colloid chemistry of, treatise, (47) 501.
- color reaction, (43) 504.
- cystein determination in, (49) 503.
- cystin determination in, (47) 504.
- deficient, relation to immunity production, (41) 574.
- denaturation, (49) 502.
- determination in honey, (49) 804.
- diagnosis by color reactions, (48) 503.
- dietary, effect on offspring, (47) 858.
- differentiation, (50) 204.
- digestibility in feeding stuffs, (47) Tex. 471.
- digestibility studies, (45) 763; (46) 163; (48) 61; (49) 503; (50) 360.
- digestion and absorption, (42) 258.
- digestion, effect of acids on, (42) 165.

Proteins—Continued.

- digestion, effect of concentration of enzym. (43) 611.
- digestion, rôle of H-ion concentration in, (45) 411.
- effect on development of swine, (49) Okla. 468.
- effect on growth, (45) 764.
- effect on inorganic metabolism, (50) 571.
- effect on insulin requirement in diabetes, (50) 766.
- ethyl acetate as precipitant, (44) 805.
- excess, effect on milk secretion, (47) 62, 859.
- fats, and carbohydrates, unusual proportions in diet, effect, (49) 360.
- free from water-soluble vitamin, preparation, (41) 761.
- from green leaves, (44) 504; (47) 109.
- from home-grown feeds for milk production, (47) 478.
- from navy beans, (48) 802.
- "good," effect on poultry, (48) 272.
- hydrolysis, (43) 110, 111; (44) 501, 709.
- hydrolysis, origin of humin in, (49) 11.
- hydrolysis, separation of amino acids from, (46) 802.
- in blood as affected by muscular work, (43) 265.
- in blood at different ages, (42) 866.
- in blood, regeneration, (41) 859.
- in diet, effect on reaction to infection with tubercle bacillus, (49) 859.
- in diet, effect on urine, (44) 169.
- in diet, minimum, (41) 763.
- in diet of tadpoles, effects, (41) 468.
- in high and low nitrogen corn, (48) 501.
- in human nutrition, discussion, (49) 762.
- in urine, determination, (43) 416.
- in vegetable juices, isoelectric points of, (42) 202.
- isolation of tryptophan from, (49) 714.
- method of purifying, (45) 505.
- methods of analysis, (41) 803; (43) 504.
- mixtures from corn and supplements, nutritive value, (49) 865.
- new fractionation method, (48) 312.
- new sulphur-containing amino acid from, (49) 714.
- nitrogen distribution in, (47) 201.
- of adzuki beans, (47) 407.
- of alfalfa plant, (46) 801.
- of almonds, biological value, (50) 857.
- of barley as affected by fertilizers, (49) 631.
- of buckwheat, (47) 502.
- of cereals, nutritive value, (42) 755.
- of colostrum, determination, (47) 715.
- of corn, genetic studies, (45) 340.
- of corn, variations, (47) 826.

Proteins—Continued.

- of feeds, nature and values, (49) Ill. 369.
- of feeds, quality, (50) 775.
- of flour, imbibitional properties as affected by acids, (50) 503.
- of Georgia velvet beans, (43) 410.
- of grain, factors affecting, (48) 529.
- of grain, variation as affected by respiration, (49) 821.
- of green leaves, (43) 409.
- of hemp seed, nutritive value, (47) 660.
- of Lima bean, studies, (48) 107.
- of meat, separation, (48) 802.
- of milk, *see* Milk proteins.
- of mungo bean, (44) 709.
- of navy bean, nutritive value, (42) 756.
- of oat straw, variations, (49) 65.
- of oats, efficiency, (41) 763.
- of oats, factors affecting, (47) Calif. 625.
- of peas, feeding value as affected by cystin, (48) 67.
- of ragweed pollen, analyses, (44) 110.
- of soy beans, (49) Ohio 308.
- of tomato seed, (47) 502.
- of unlike composition, comparative metabolism, (45) 262.
- of velvet beans, cystin as growth-limiting factor in, (47) 365.
- of velvet beans, nutritive value, (47) 461.
- of walnuts, (50) 462.
- of weak and strong flours, (49) 308.
- of wheat, (41) 262.
- of wheat bran, analyses, (50) 711.
- of wheat, effect of fallow, (48) Calif. 526.
- of wheat endosperm, distribution, (45) 363.
- of wheat, factors affecting, (44) 735; (47) 233, Calif. 625, Idaho 636.
- photosynthesis, (48) 501.
- plasma, determination, (47) 205.
- precipitants for, (48) 109.
- production and consumption in United States, (43) 61.
- qualitative differences in relation to nutrition, (46) 255.
- quality and quantity in diet, (50) 266.
- rate of digestion, (44) 110; (48) 312.
- removal from cereal extracts, technique, (49) 110.
- removal in blood analysis, (43) 205.
- rôle in vitamin hunger, (49) 364.
- small amounts, nephelometric determination, (50) 713.
- soluble, from soy beans, preparation, (46) 356.
- soluble, in remade milk, (47) 111.
- source for laying hens, (43) Okla 73, Ky. 871; (46) Ky. 875; (49) Idaho 273, Idaho 777.
- specific dynamic action, (41) 171.
- sterilizing, new method, (48) 502.

Proteins—Continued.

- stimulation of cellular system by, (41) 471.
- sugar formation from, (41) 363.
- sulphur in, (47) 310.
- tryptophan in, (45) 312, 313; (47) 504; (48) 312, 313.
- tyrosin determination in, (47) 311, 504.
- urea substitution for, (48) 375, 376.
- utilization in nutrition, (49) 158.
- utilization, rôle of fats in, (41) 670; (45) 865.
- value for poultry, (49) 273.
- vegetable, studies, (43) 10, 409; (45) 108; (47) 364; (49) 360.
- yielding arginin, relation to presence of urease, (41) 111.
- Proteinuria in newborn calves, cause, (50) 883.
- Proteopteryx oregonana, summary, (44) 753.
- Proteoses, antigenic property, (41) 575.
- Proteus group organisms, studies, (41) 33.
- Protochrome, use of term, (44) 170.
- Protomycetaceae, development and biology, (50) 630.
- Protoparce—
 - cingulata, notes, (43) 252; (48) 153.
 - quinquemaculata, *see* Tobacco worm.
 - sexta, *see* Tomato worm.
 - spp., disease of, (50) 845.
 - spp., notes, (50) V.I. 555.
- Protoplasm—
 - character of, (45) 333.
 - components and colloidal behavior. (43) 429; (45) 819; (46) 25.
 - growth curves, (43) 525.
 - growth mechanism, (41) 26; (48) 429.
 - in plants, evolution, (45) 30.
 - physical properties, (47) 222.
 - reversible gelatin in, (47) 30.
 - structure, (43) 132.
 - studies, (50) 525.
 - viscosity values, (45) 337.
- Protoplasts, effects of neutral salts, (48) 126.
- Protoplasts, sensitivity and permeability (45) 733.
- Prototrophus n.spp., description, (45) 258.
- Protozoa—
 - and bacteria, pathogenic, textbook, (42) 878.
 - and Brazilian soils, (50) 517.
 - associated with mosaic diseases, (48) Mich. 644.
 - cyst-forming, in reindeer, (48) 151.
 - in man, diagnosis, (45) 655
 - in man, treatise, (47) 383.
 - in New Jersey soils, (43) 217.
 - in Rothamsted soils, (44) 126.
 - in soil, (45) 213.
 - in soil—
 - and water, (48) 817.
 - effect on fertility, (41) 515.
 - estimation, (44) 126.

Protozoa—Continued.

- in soil—continued.
 - in Alps, distribution, (47) 724.
 - method for counting, (42) 217.
 - methods of study, (49) 515.
 - rôle, (49) 515.
 - studies, (42) 217; (49) 515.
- in South African soils, (50) 518.
- intestinal, effect of carbon tetrachlorid, (49) 476.
- intestinal, of man, carriage by flies, (45) 556.
- relation to necrobacillosis in sheep, (45) 385.
- with mosaic disease, (49) Mich. 45.
- Protozoology, textbook, (43) 659; (44) 373.
- Protozoology, treatise, (46) 78.
- Protrama, new genus, erection, (43) U.S.D.A. 758.
- Protura, Nearctic species, notes, (46) 255.
- Protura, new genera and species, (46) 465.
- Provancher, life and works, (49) 848.

Prune—

- aphids, control, (46) 855; (47) Idaho 759.
- brown rot, notes, (43) 656; (47) Calif. 649.
- butter manufacture, (46) 755.
- diseases, notes, (44) Wash. 53, Oreg. 840.
- diseases, parasitic, 1915–1920, (49) 445.
- diseases, spray schedule, (42) Wash. 836.
- drought spot, notes, (46) 452.
- heart rot in Oregon, (48) 147.
- leaf spot, notes, (44) Oreg. 840.
- leaves, transpiration, (48) 236.
- orchard survey, (43) Colo. 144.
- orchards, fertilizer experiments, (43) Wash. 744.
- orchards, irrigation experiments, (47) Calif. 639.
- root borer, control, (44) Oreg. 850; (46) 750; (47) 855; (50) Oreg. 53.
- scale, notes, (43) 252.
- tree borer, flat-headed, (44) Oreg. 850.

Prunes—

- analyses, Calif. (42) 862; (44) 738.
- crop failures, causes, (43) Wash. 745.
- culture, (43) Wash. 744.
- culture and curing, (45) Calif. 837.
- culture experiments, (50) Mont. 139.
- culture in Asia, (45) 45.
- depth of planting studies, (44) Oreg. 835.
- dried, antiscorbutic value, (47) 62.
- dried, energy value, (46) 859.
- drying, (41) 557; (42) Calif. 804; (44) Oreg. 809; (45) 720, Calif. 808; (48) Calif. 507.
- drying by recirculation drier, (49) Oreg. 388.
- drying, evaporators for, (41) Calif. 117.

Prunes—Continued.

- drying temperature, (49) Oreg. 507.
- dusting experiments, (44) Calif. 752.
- fertilizer experiments, (43) Wash. 744; (44) Oreg. 835.
- freezing temperature for buds, (44) 740.
- French, new variety, origin, (42) 140.
- Herald, new type, (45) 139, 346.
- irrigation experiments, (44) Calif. 738.
- pollination, Calif. (42), 41, 832.
- preserving, (45) 665.
- pruning data, (48) Calif. 534.
- pruning experiments, Calif. (42) 139; (44) 738.
- rain-damaged, salvaging, (41) Calif. 117.
- renovation studies, (45) Wash. 236.
- seasonal water requirements, (48) Calif. 585.
- spacing experiments, (47) Calif. 638.
- stocks for, (42) 737, Calif. 833; (43) 745; (44) 145; (48) 39.
- storage temperature, (47) 151.
- sugar or moisture in as affected by fertilizers, (47) Calif. 639.
- transpiration studies, (47) Calif. 628.
- transportation rot, relation to spraying, (47) 152.
- variety tests, (47) 339.
- vitamin B in, (43) 765.
- Pruning—*see also special trees and shrubs.*
 - and economy of water, (43) 235.
 - effect on grapefruit, (43) 439.
 - effect on lemons, (43) 239.
 - experiment station research in, (49) 106.
 - experiments, results, (45) 439.
 - fundamental principles, (48) 838.
 - long and old style, (46) 640.
 - of trees, popular account, (45) 348.
 - practice and principles, (45) 238, 538.
 - wounds, treatment, (44) Oreg. 839; (47) 344.

Prunus—

- cerasus, anatomy, effect of sunlight and shade, (48) 827.
- davidiana, culture experiments, (48) U.S.D.A. 235.
- hardy crosses, (42) 637.
- stocks, identification, (49) Calif. 637.
- stocks, resistance to crown gall, Calif. (44) 743; (48) 543.
- varieties, sterility in, (49) 222.
- Prussic acid—*see also Hydrocyanic acid.*
 - in forage, poisonous to livestock, (46) 484.
 - in jowar, (46) 722.
- Psacaphora metallifera, notes, (42) 157.
- Psalliota, studies, (41) 834.
- Psallus ambiguus, notes, (44) 454.
- Psammocharidae species, descriptions, (42) 550.
- Pseninae, new species, (46) 58.
- Psenocerus supernotatus, notes, (42) 748.

Pseudoaonidia—

- duplex in Mississippi, (47) 255.
- duplex, notes, (48) U.S.D.A. 52, 457.
- tesserata, notes, (50) V.I. 555.

Pseuderimerus mayetiolae n.g. and n.sp., description, (41) 63.

Pseudococcus—

- bakeri, control, summary of information, (42) 649.
- bromeliae, notes, (43) 52.
- calceolariae, notes, (48) U.S.D.A. 458; (49) La. 52.
- citri, *see* Citrus mealybug.
- gahani, control, (47) U.S.D.A. 158.
- hibisci, life history and control, (47) 851.
- longispinus, summary, (50) Mich. 454.
- maritimus, control, Calif. (47) 653; (48) 551.
- maritimus, notes, (47) 657.
- maritimus on cedar in Florida, (49) 354.
- maritimus on roots and nodules of legumes, (49) 655.
- nipae, *see* Coconut mealybug.
- sacchari on sugarcane, (48) 854.
- sentrifolii affecting peanuts, (42) 358.
- sp. on peanuts, (42) 52.
- sp., paper on, (48) 852.
- spp., notes, (41) 756; (43) 660; (45) V.I. 150; (47) 254, 255.

Pseudoglobulin, precipitability, (41) 283.

Pseudogonatopus sogatea n.sp., description, (43) 857.

Pseudograsserie of gipsy moth, (41) 357.

Pseudohermaphroditism, (47) 863.

"Pseudo-index for iodine," use of term, (43) 315.

Pseudomonas—

- albobacillans n.sp., description, (50) 349.
- apii n.sp., description, (45) 246.
- avenae, remedies, (42) 644.
- campestris, notes, (43) 751; (45) 47, 842; (48) 842; (50) 353.
- caudatus, description, (42) N.Y.State 325.
- cerasus, studies, (42) Calif. 843; (50) 751.
- citri, *see* Citrus canker.
- citriputeale, notes, (49) Calif. 651.
- fluorescens—
 - action on manure, (48) N.Y.State 20.
 - and P. caudatus, studies, (41) 20.
 - description, (42) N.Y.State 325.
 - in decomposing salmon, (46) 754.
- juglandis—
 - control, (43) 350.
 - infection and resistance to, (47) 547.
 - notes, (44) 247; (46) 144.
 - studies, (50) 753.
- luminescens, studies, (41) 222.
- phaseoli, description, (48) 741.
- phaseoli, notes, (43) 652; (48) 242.

Pseudomonas—Continued.

- polysaccharidarum n.sp., studies, (43) 524.
- proteamaculans, suggested name, (44) 644.
- pruni, studies, (49) 546.
- pyocyaneus, rôle in swine pneumonia, (45) 381; (46) 83.
- savastanoi, pathogenicity, (50) 752.
- sp. on beans, (41) 450.
- spp., notes, (46) 450; (47) 838.
- tolaasi, suggested name, (44) 644.
- tumefaciens, notes, (42) 645; (44) Conn.State 149.
- Pseudoperonospora cubensis—
 - notes, (48) Mass. 643.
 - on Trichosanthes dioica, (50) 148.
- Pseudopeziza—
 - medicaginis and P. trifolii, studies, (41) U.S.D.A. 346.
 - medicaginis, notes, (50) 447.
 - ribis, notes, (46) 243, 844.
 - spp., notes, (42) N.Y.State 350.
 - studies, (45) 746.
- Pseudophilus testaceus, notes, (47) 758.
- Pseudopityophthorus gracilis n.sp., description, (46) Miss. 462.
- Pseudothysanoses n.g., description, (46) Miss. 461.
- Psichaera spp., parasitism by, (46) 158.
- Psidium araca diseases, (45) 648.
- Psila rosae, control, (48) 157.
- Psillidae, synopsis of family, (44) 760.
- Psillocybe samoaensis, notes, (47) 547.
- Psilogaster fasciventris n.sp., description, (42) 159.
- Psithyrus spp., new American hosts of, (47) 856.
- Psocids, control, (43) U.S.D.A. 53.
- Psoralea, poisonous to livestock, (45) Wyo. 479.
- Psorolyma maxillosa n.sp., notes, (49) 550.
- Psorosis, notes, Calif. (47) 651; (49) 649.
- Psorosis of orange trees, studies, (49) 847.
- Psychoda alternata, notes, (41) 165; (42) N.J. 849.
- Psychology, application, (47) 358.
- Psychometric observations, reduction tables, (41) 808.
- Psylla pyri, *see* Pear psylla.
- Psyllia isitis, notes, (43) 451.
- Psyllia mali, *see* Apple sucker.
- Psyllidae—
 - bibliography of, (44) 353.
 - classification, (44) 59.
 - new genera and species, keys, (43) 450.
 - notes, (45) 658.
- Psyllids, chalcidoid parasites of, summary, (48) 753.
- Psylliodes spp., life history and habits, (48) 359.
- Psyllobora taedata, anatomical and biological studies, (45) 257.
- Psyllopsis fraxini, natural history, (44) 59.
- Ptaeroxylon utile, heart rot of, (41) 453.

- Pteromalus puparum*, notes, (42) 156; (45) 755; (48) 158.
- Pteronius ribesii*, *see* Currant worm, imported.
- Pterothrips*, new genus, erection, (42) 154.
- Pterygophorus analis* larvae fatal to cattle, (46) 776.
- Ptilodexia* spp., parasites of white grubs, (42) 549.
- Ptinid beetles, new species, (41) 63.
- Ptinidae, new North American, notes, (42) 158.
- Ptyalin, action of, (41) 614.
- Ptyalin in saliva of infants, (47) 766.
- Ptychopteridae, studies, (42) N.Y.Cornell 157.
- Pubescence as affected by restricted diet, (49) 459.
- Public health, *see* Health, public.
- Puccinellia airoides*, analyses, (41) Wyo. 333.
- Puccinia**—
- abrepta* n.sp., description, (42) 448, 644.
- albiperidia*, internal aecia of, (48) 451.
- allii*, notes, (50) 143.
- antirrhini*—
- control, (46) Mass. 653; (49) N.H. 651.
- germination of teliospores, (49) 243.
- notes, (41) Ill. 752; (43) 841; (44) Pa. 746; (45) 851.
- asparagi*, *see* Asparagus rust.
- caricis*, heteroecism and specialization, (44) 539.
- caricis*, new forms of, (45) 541.
- chrysanthemi*, notes, (44) Pa. 746; (47) 242.
- coronata*—
- biologic forms, (43) 653.
- infection capabilities, (50) 548.
- notes, Iowa (41) 49; (42) 448; (47) 542.
- spores, germination, (50) 746.
- studies, (48) 845.
- cyperi-tagetiformis* n.comb., description, (42) 448, 643.
- dispersa*, life cycle, (49) Ind. 538.
- dispersa*, notes, (50) 648.
- dispersa*, resistance of rye to, (50) 129.
- glumarum*—
- life history, studies, (49) 748.
- notes, (42) 46; (43) 45; (44) 447, 842; (47) 543.
- specialized varieties, (50) 244.
- tritici, specialized forms, (50) 245.
- graminis*—
- avenae, notes, (46) 545.
- biologic forms, (48) Minn. 346; (49) 748, 840.
- biologic forms, parasitic capabilities, (48) 644.
- dissemination, (41) 50.
- genetics of resistance to, (44) 50.
- infection of *Berberis* by, (48) 842.
- Puccinia*—Continued.
- graminis*—continued.
- notes, (42) 742; (43) 45, 347; (44) 342; (48) 145.
- on *Berberis canadensis*, (45) 541.
- on wheat, (42) Iowa 448.
- popular account, (41) U.S.D.A. 656.
- regional occurrence on barberry, (47) 246.
- relation to grasses, (46) 448.
- resistance, mode of inheritance, (49) 840.
- spore germination, effect of acidity, (49) 125.
- studies, (42) 242; (43) Iowa 653.
- telia, behavior, (48) 845.
- tritici*—
- Form III, (48) Nebr. 45.
- Form III and IX, (50) Nebr. 446.
- Form III and XIX, (50) 839.
- germination, effect of citric acid, (46) 846.
- infection, cytological study, (49) 45.
- inheritance of resistance to, (50) 634, 635.
- notes, (43) 546; (44) 539; (45) 542.
- resistance to, (41) 535.
- studies, (41) Kans. 48; (42) 244.
- tritici-compacti*, studies, (42) 244.
- helianthi*, studies, (50) Minn. 654, 655.
- jambulana*, notes, (45) 647.
- kuehnii*, notes, (46) 45.
- liberta* n.sp., description, (42) 448, 644.
- malvacearum*—
- and mycoplasm theory, (43) 444.
- studies, (49) 651; (50) 150, 250.
- teliospores, germination, (48) N.H. 544.
- petasiti-pulchellae* n.sp., studies, (42) 46.
- phakopsoroides* n.sp., description, (43) 244.
- pittieriana*, notes, (45) 353.
- pittieriana*, survey, (44) 749.
- porri*, notes, (44) Conn.State 150.
- pruni* on peach, (46) 845.
- prunispinosae*, notes, (46) 453.
- purpurea*, notes, (47) 544.
- ribis*, studies, (42) Conn.State 247.
- rubigovera*, notes, (45) 845.
- sorgi*, notes, (47) 44; (50) 747.
- spp., aecial stage, (49) Wash.Col. 242.
- spp. and *Uredo* sp., comparison, (43) 244.
- spp., descriptions, (42) 643.
- spp., effect on photosynthesis, (44) 518.
- spp., heteroecism of, (48) 845.
- spp., morphological study, (43) 844.

Puccinia—Continued.

spp., notes, (42) Iowa 448; (43) 346;
(44) 446; (47) 348; (49) 442, Ga.
541; (50) 548.

spp. on cereals, (46) 239, 240.

spp., temperature of spore germination, N.H. (43) 842; (46) 343.

subnitens and aecial hosts, (43) 444.

trititica—

aecial stage, (46) 144.

notes, (46) 845.

spores in the upper air, (49) 747.

strains on wheat, (47) 247.

Pucciniaceae of Guatemala, (41) 135.

Pucciniastrum—

americanum, morphology and host relations, (49) 846.

hydrangeae, alternate stage, (45) 548.

myrtili on cranberries, (45) U.S.D.A. 54.

Puddings, digestion, (44) 665.

Pulex irritans, notes, (50) 55.

Pullet house, construction, (49) West. Wash. 87.

Pullets—

care in summer, (43) N.J. 174.

characters indicative of egg production, (49) Iowa 777.

cock feathering and ovarian tumor in, (42) 671.

crate feeding, effect, (50) Can. 779.

development, effect of time of hatching, (46) N.Mex. 370.

early v. late-hatched, (50) Can. 275.

early v. late-maturing, (46) Ohio 768.

egg production, (47) Minn. 378, West. Wash. 873.

egg production and broodiness, (43) N.J. 173.

eggs, first, size in relation to age, (47) 672.

fall and winter care, (46) Mich. 598.

feeding experiments, (46) Ind. 574; (47) N.Mex. 475.

feeding schedule for, (49) West. Wash. 874.

finishing, (45) N.J. 677.

inducement to laying, (45) Wash. 776.

raising, (49) West. Wash. 71.

Pulley tests, summary, (46) 782.

Pulley widths and speeds for tractors, (45) 892.

Pulleys, keyed, methods of removing from shaft, (42) 783.

Pulleys, standard belt, formulas, (46) 287.

Pulmonary disease, relation to Ascaris, (43) 80.

Pulp—see also Paper pulp, Pulpwood, and Wood pulp.

bleaching formulas, (47) 207.

industry in Canada, (41) 840.

Pulpwood—see also Wood pulp.

American, (43) 650.

and wood pulp in North America, treatise, (50) 545.

consumption, statistics, U.S.D.A. (42) 144; (50) 41.

Pulpwood—Continued.

fungi attacking, (43) 651.

insects affecting, (47) Minn. 356.

production, choice of species for, (45) 442.

production v. budworm infestation, (49) 452.

Pulse—

as affected by high altitudes, (43) 565.

beetles, enemies and control, (42) 158.

crops, fungoid and insect pests, (41) 56.

diseases in England and Wales, (49) 645.

rate of fowls, (50) 82.

Pulses, insects affecting in India, (45) 656.

Pulsia gamma, notes, (48) 152.

Pulvinaria—

iceryi, notes, (44) 159.

innumerabilis, symbiotic fungus in, (46) 246.

ornata n.sp., description, (45) 860.

pyriformis on avocado, (42) 546.

vitis, see Maple scale, cottony.

Pump installation, pitcher, (47) 794.

Pumping—

for irrigation, (41) 481, 785; (49) 886.

for irrigation, small plant, (41) Oreg. 688.

machinery, treatise, (42) 480.

plants, tests, (41) 882.

Pumpkin—

as flour substitute, (41) 558.

bug in citrus groves, (41) 355.

diseases, notes, (41) 745.

flour, dehydrated, (47) 763.

flour, preparation, (48) Calif. 506.

juice, antiscorbutic value, (47) 568.

leaves, temperature, (50) 425.

mildews, control, (42) Guam 38.

seeds as source of oil, (41) 209.

seeds, effect on animal metabolism, (45) 672.

sleeping sickness, notes, (45) 842.

Pumpkins—

canning, temperature changes in, (45) U.S.D.A. 560.

culture experiments, (48) V.I. 340.

pruning experiments, (44) Mont. 337.

Pumps—

air lift, construction and operation, (49) 886.

air lift, notes, (47) 887; (49) 184.

centrifugal, determining efficiency, (45) 789.

centrifugal, theory of action of impellers, (49) 83.

electric, tests and operating records, (42) 182.

Puncture vine, control, (47) 235.

Puncture vine, spread in California, (44) 439.

Purdue University, notes, (41) 300, 496; (42) 497, 600; (43) 198, 398, 799; (44) 298, 396; (45) 199, 600; (46) 195, 499, 794, 899; (48) 695; (49) 697, 899; (50) 599, 697.

- Purgatives, use after anthelmintics, comparisons, (42) 675.
- Purin metabolism, (50) 664.
- Purin metabolism, endogenous, effect of diet, (46) 757.
- Purnell Bill, (50) 895.
- Purnell Bill, how to secure national interest in, (49) 492.
- Purple scale—
control, (44) 59.
fumigation, (41) 164.
notes, (41) 660.
- Purpura hemorrhagica—
in horses, formaldehyde treatment, (50) 482.
relation to epizootic contagious catarrh, (44) 76, 683.
treatment, (46) 686.
- Purslane, control by spraying, (41) 537.
- Putnam's scale in South Dakota, (41) 59.
- Putnam's scale, notes, (42) 748.
- Putting greens, instructions for grass planting, (49) 635.
- Pycnidia, origin and development, (43) 226.
- Pycnoscelus surinamensis, studies, (41) Conn.State 158.
- Pycnosoma spp., notes, (49) 156.
- Pygostolus falcatus, notes, (48) 57.
- Pyogenic coccus of sheep, (49) 182.
- Pyogenic infections, immunization, oral route for, (50) 478.
- Pyogenic infections, serotherapy, (41) 188.
- Pyometra in cattle, pathology, (47) Mich. 83.
- Pyosepticemia pullorum neonatorum, origin, treatment, and prevention, (47) 588.
- Pyotherapy—
in treatment of lymphangitis, (41) 192.
review of literature, (41) 375; (43) 580.
- Pyralis farinalis, *see* Meal moths.
- Pyrausta ainsliei—
biology of, (45) 154.
life history, (46) 660.
n.sp., notes, (42) 361.
on corn, notes, (42) Ohio 852.
studies, (43) Conn.State 251.
- Pyrausta—
caffrei n.sp., description, (43) 661.
nubilalis, *see* Corn borer, European.
penitalis, biology, (47) U.S.D.A. 760.
penitalis, notes, (42) 250, 361, 546; (44) 352.
spp., distinguishing characters, (43) 661.
- Pyraustomyia penitalis, parasitism by, (45) 155.
- Pyrenopeziza, studies, (45) 746.
- Pyrenophora, ascospore discharge, (41) 746.
- Pyrethron, insecticidal principle, (42) 647.
- Pyrethrum—
alcoholic extract, insecticidal value, (46) 748.
culture in France, (47) 835.
insecticidal value, (44) U.S.D.A. 162.
- Pyrgota spp., parasites of white grubs, (42) 550.
- Pyrheliometer—
Callendar, notes, (43) U.S.D.A. 719.
vacuum, and solar radiation, (47) 209.
- Pyrheliometers—
comparisons, (42) U.S.D.A. 620.
standardization, (46) 418.
- Pyridin sulphate, cause of caking in ammonium sulphate, (43) 25.
- Pyriform scale, notes, (47) U.S.D.A. 157.
- Pyriloxenos compactus, notes, (48) 552.
- Pyrite, effect on sulphate leachings, (50) 523.
- Pyrites oxidation products in peat, (44) 625.
- Pyrites production and trade, (48) 623.
- Pyroderces—
rileyi, notes, (48) U.S.D.A. 458; (49) V.I. 353.
simplex, differentiation, (41) 552.
simplex, notes, (48) 56.
spodotha, notes, (47) 358.
- Pyrolaceae, germination in, (49) 424.
- Pyrolusite from Virginia, (41) 420.
- Pyronema in heated soil, (41) 216, 217.
- Pyrophorus luminosus, notes, (50) 457.
- Pyropolyporus robiniae, notes, (41) 752.
- Pyrox, value against potato pests, (42) Mass. 356.
- Pyrus species in Indo-China, (45) 345.
- Pyrus stocks, identification, (49) Calif. 637.
- Pythiacystis citrophthora—
control, (47) 651; (48) 50; (49) 846.
distribution, (46) 149.
effect of temperature, (48) Calif. 543; (49) 540.
notes, (45) 842; (46) 651; (48) 548, 746; (49) Calif. 649, 650.
on nursery stock, (47) Calif. 649.
studies, (42) Calif. 842.
- Pythium—
and Rhizoctonia in coniferous seed beds, relative importance, (42) 248.
artotrogus on pine seedlings, (42) 248.
butleri n.sp., notes, (43) 445; (44) 150, 446.
butleri, notes, (46) 347.
debaryanum—
notes, (42) 46; (44) Conn.State 150, 446; (45) U.S.D.A. 357, N.C. 443; (46) 45, 847; (48) 244, 348.
on pine seedlings, (42) 248.
on potato, (42) 449.
on sugar beets, (46) 450.
on sugar cane, (42) Hawaii 353.
on tomato, (46) 451.
gracile, notes, (43) 652; (44) 445.
hydno sporum, notes, (44) Conn.State 150.
like fungi on potato, (50) 652.
on sugar cane, (42) 643.
palmivorum, notes, (42) 741; (43) 445; (47) 153, 547.
sp., notes, (44) 445, 845.

Pythium—Continued.

- spp., notes, (48) 48, 740.
- studies, (48) Del. 642.

Quack grass—

- characteristics and control, (48) U.S.D.A. 836.
- eradication, (41) Iowa 227.

Quadrats for study of plant climax formation, (41) 327.

Quail disease, cause, (45) 889.

Quarantine—

- acts in Porto Rico, (44) 836.
- Federal in tick-infested area, (42) 179.
- laws and regulations in Japan, (44) 40.
- No. 37, operation, (45) 253.
- orders of California, (43) 741.
- orders of South Dakota, (47) 848.
- regulations, Federal, for nursery stock, (44) Mo. 638.
- work with green Japanese beetle, (43) 362.

Quaylea aliena, notes on new genus, (43) 662.

Quebracho—

- bark ashes, fertilizing value, (46) 823.
- forests of South America, (45) 442.
- logs, exports from Argentina, (43) 95.

Quercetin, occurrence in brown-husked corn, (46) 125.

Quince—

- as dwarfing stocks for pears, (44) 42.
- brown rot, notes, (47) Calif. 649; (49) 442.
- curculio, remedies, (41) 853.
- diseases, (42) 541.
- diseases, control, (43) 544, Ill. 847.
- fire blight, notes, (49) 442.
- rust in Oregon, (41) 152.

Quinces—

- calyx spray, formula, (49) Conn.State 742.
- culture, (44) Del. 440; (48) U.S.D.A. 235.
- culture experiments in Arizona, (50) U.S.D.A. 138.
- preserving, (45) 665.
- spray schedule, (43) N.J. 37; (47) N.J. 140, Ohio 140; (49) N.J. 138.
- variety tests, (43) Md. 143; (45) 45.

Quinin—

- effect on catalase production, (42) 259.
- effect on malaria parasite, (44) 759.
- effect on nitrogen content of egg albumin, (44) 566.
- hydrobromid for nuttalliosis, (44) 83.
- production in Java, (48) 447.
- residue, effect on denitrifying bacteria, (42) 19.

Quinoa, culture experiments, (45) 735.

Quinol, color reaction, (46) 668.

Quinolins, tetramethyl, (44) 504.

Quiscalus quiscalus, notes, (41) 846.

Rabbit—

- blood, nature of sugar in, (49) 715.
- brush poisonous to livestock, (47) Nev. 786.
- brush poisonous to sheep, (46) 396.

Rabbit—Continued.

- brush, spring, poisonous to sheep, (49) Nev. 582.
- coccidium, new, (41) 784.
- diseases, (43) 887.
- feeds, analyses, (44) Mich. 568.
- meat, digestibility, (43) U.S.D.A. 365; (44) 661.
- meat, recipes, U.S.D.A. (43) 365, 378.
- muscle, diamino acid content, (47) 610.
- tick, transmission of spotted fever by, (48) 776.

Rabbits—

- age and chemical development, (50) 569.
- Angora, breeding, (49) 374.
- as affected by vitamin deficiency, (43) 369.
- as meat producers, (42) 770.
- avenue of infection by Bacterium abortum, (49) 477.
- breeding and care, (42) 268.
- breeding and management, (50) 474.
- breeds, description, (50) 275.
- carbohydrate metabolism in, (44) 464.
- care and management, (43) 873; (47) 378.
- "chinchilla," breeding experiments, (45) 168.
- cottontail, occurrence of warts on, (45) 452.
- destructive to beech trees, (49) 537.
- diseases and control, (47) 287, 483.
- diseases of, treatise, (46) 276.
- Dutch, genetics of, (44) 363; (45) 871.
- effect of excessive sexual activity, (42) 467.
- effect of sexual activity, (47) 278.
- exhibition standards, (43) 575.
- feeding, (44) Mont. 369, Wash. 573.
- feeding experiments, (43) Wash. 676.
- fertility and fetal atrophy, (47) 863.
- genetic studies, (49) 366.
- glycogen and glucose in muscles, (49) 570.
- inheritance of color, (42) 762; (48) 565.
- inheritance of color and pattern in, (49) 66.
- inheritance of fur type and hair characters, (48) 762.
- inheritance of weight, (42) 763.
- keeping as protection against malaria transmission, (47) 554.
- marketing, (48) Calif. 573.
- microorganisms in lungs of, (48) 278.
- newborn, respiratory exchange in, (49) 15.
- nitrogenous metabolism, effect of indol and skatol, (48) 766.
- offspring of two sires in one litter, (49) 266; (50) 631.
- ovaries, cyclic changes, (44) 468.
- peanut-fed, changes in fat cf, (45) 272.

Rabbits—Continued.

- protection of fruit trees from, (43) Ohio 340.
- raising, (43) U.S.D.A. 378; (46) Wash. 498; (50) 152.
- raising for meat, (41) U.S.D.A. 676.
- raising for skins, (43) Can. 873.
- raising, treatise, (44) 369.
- snowshoe, injurious to conifers, (46) 447.
- synthetic Mendelian forms in, (48) 468.
- toxicity of carbon tetrachlorid for, (50) 283.
- treatise, (43) 174.
- Vienna White, genetics, (47) 277.
- vitamin A requirements, (47) 169, 772, 862.
- waltzing, (49) 463.
- zinc in, variation, (46) 667.

Rabic virus—

- action of phenol on, (45) 684.
- desiccated, preparation, (46) 181.
- diffusibility, (41) 190.
- effect of ether on, (43) 81.
- preservation, methods, (43) 583.

Rabies—

- antiserum, rabicidal property, (48) 677.
- changes in blood and distribution of virus in animals infected with, (49) 782.
- control, (49) 179.
- control in Massachusetts, (46) 681.
- diagnosis, (44) 376.
- discussion, (45) 581.
- heredity of, (42) 178, 778.
- immunization method, (46) 278.
- in Canada, (47) 181.
- in Great Britain, (46) 178.
- in India, control, (47) 878.
- notes, (41) 280, 873; (44) 180; (46) 773; (50) 582.
- prophylactic treatment, (47) 385; (48) 279.
- prophylaxis and treatment, (41) 576.
- recovery from, (45) 883.
- vaccine, single dose treatment, (49) 478.

Raccoons, breeding, (48) 768.

Radiation—

- nocturnal, during calm nights, (44) 617.
- nocturnal, intensity at high altitudes, (43) 718.
- solar—
 - and unusual winter weather, (50) 314.
 - and vacuum pyrhelometer, (47) 209.
 - in relation to plant distribution, (43) 731.
 - measurements, (43) U.S.D.A. 719; (50) 209.
 - observations, (43) U.S.D.A. 117.
 - results of work, (50) 509.

Radiation—Continued.

solar—continued.

- variation in, effect on weather, (43) 809; (44) 313.
- variations, U.S.D.A. (42) 618, 620.
- world observatories for, (43) U.S.D.A. 719.
- with mercury vapor quartz lamp, effect on rats on deficient diet, (49) 60, 61; (50) 568.

Radiator fan, design, (42) 686.

"Radio" manure, fertilizing value, (46) 221; (47) 521.

Radio set, home, construction, (48) 889.

Radioactive fertilizer, experiments, (45) 517.

Radioactivity—

- and normal physiological function, (45) 218.
- in agriculture, (48) 724.
- of fertilizers, measuring, (49) 217.
- of potassium, relation to plant growth, (45) 428.
- tests in Spain, (49) 217.

Radish—

- maggot, control, (47) Ind. 156, 257, Idaho 258; (49) 557, 854.
- seeds as affected by radium, (47) 426.
- seeds, manganese content, (49) 731.

Radishes—

- aerial fertilization with carbon dioxide, (41) Vt. 833.
- as greenhouse crop, (44) Oreg. 834.
- Bacillus botulinus on, (44) 763.
- carbon-nitrogen ratio for, (43) 430.
- culture, (43) 638; (44) Alaska 532; (49) Alaska 435.
- culture experiments, (48) V.I. 340.
- fertilizer experiments, (41) 627; (49) R.I. 533.
- growth and composition as affected by length of day, (49) 739.
- growth in alkali soil, early, (42) Utah 28.
- growth in artificial light, (48) 26.
- inheritance studies, (47) 638.
- root development, (43) 834.
- rotation experiments, (42) 230.
- sodium for, (41) R.I. 426.
- variety tests, (42) Minn. 835; (43) Tex. 36; (45) N.Dak. 235.
- vitamin B content, (44) 261.

Radium—

- action on plants as affected by light, (41) 523.
- effect on metabolism and growth in seeds, (47) 426.
- effect on seed germination, (50) 325.
- emanation, effect on vitamins of yeast, (42) 167.
- use against plant diseases, (50) 345.

Raffinose—

- and sucrose mixtures, analysis, (46) 205.
- determination, (44) 805.

Raffinose—Continued.

- fermentation products, (48) 108.
- preparation, (47) 202.

Ragi—

- breeding experiments, (44) 137; (48) 434.
- culture directions, (45) 35.
- culture experiments, (44) 137; (48) 434.
- culture in Federated Malay States, (42) 35.
- culture in Mysore, (44) 231.
- fertilizer experiments, (48) 434.
- notes, (49) Guam 427.
- Piricularia on, (46) 448.
- pollen, germination, (50) 433.
- root parasites, (46) 343.
- variety tests, (48) 434.

Ragweed—

- pollen proteins, analyses, (44) 110.
- wound and fungus-gall stimuli in, (41) 526.

Ragwort, notes, (49) 179.

Rahar wilt disease, notes, (44) 445, 446.

Railroad—

- lunch rooms and dining car catering, (48) 61.

rates—

- and farm prices, (48) 689.
- effect on fertilizer industry, (46) 522.
- on agricultural products in France, (46) 694.
- on conveyance of pigs, (48) 171.
- relation to agricultural development, (48) 689.
- refrigerator cars, operation, (48) 91.
- ties, average life, (42) 281.
- ties, volume table, (42) 240.
- ties, western species for, (50) 142.
- transportation, difficulties, (44) U.S. D.A. 884.

Railroading, weather element in, (47) U.S. D.A. 316.

Rain—

- absorption, factors affecting, (43) Mo. 721.
- analyses, (46) U.S.D.A. 116; (49) 413; (50) 716.
- artificial, apparatus, tests, (49) 486.
- artificial, on cultivated soil, (49) 83.
- artificial production, (47) U.S.D.A. 17.
- dissemination of plant diseases by, (41) S.C. 50.
- effect on—
 - boll weevil poisoning, (43) 162.
 - fertilization and bearing in fruit trees, (47) 128.
 - formaldehyde treatment of onion smut, (50) 748.
 - ozone content of air, (44) 508.
 - pollination, (47) 742.
 - sprays, (43) 657.
- fertilizing value, Can. (41) 510; (43) 728; (45) 818; (48) 22.
- gauges, exposure, (44) 209.
- in Iowa, analyses, (47) U.S.D.A. 17.

Rain—Continued.

- nitrogen, chlorin, and sulphates in, (41) 620.
- nitrogen in, (44) 811; (47) 213; (48) 114.
- substances dissolved in, (45) 618.
- water—
 - clarification and storage, (48) 184.
 - dead leaves in, effect on grain germination, (46) 813.
 - effect on phosphatic slag, (45) 624.
 - sulphur in, (46) 16; (48) 823; (49) Ill. 315, 727.

Rainfall—see also Precipitation.

- and barometric variation in Bulawayo, (45) 511.
- and run-off studies, (46) 380; (50) 586.
- and temperature, (45) Miss. 210.
- and temperature in New South Wales, (47) 720.
- and wheat prices in Europe, (47) 719.
- annual, of Tripoli, (45) 618.
- as affected by large reservoir, (43) U.S.D.A. 119.
- as affected by lunar periods, (43) 417.
- at Rothamsted, amount and composition, (42) 213.
- at Rothamsted, records, (46) 314.
- average annual, (48) U.S.D.A. 417.
- cyclic nature, (49) 30.
- data for determining road conditions, (43) U.S.D.A. 117.
- data, paradoxical, (49) 314.
- deficient in California, (44) U.S.D.A. 415.
- distribution in Brazil, (50) 415.
- distribution in France, (45) 18.
- distribution in Germany, (42) 118.
- duration, intensity, and periodicity, relation, (49) U.S.D.A. 719.
- during 1922, (48) U.S.D.A. 418.
- effect of cultivation on, U.S.D.A. (42) 617, 620.
- effect of Great Lakes, (46) U.S.D.A. 619.
- effect on—
 - borax injury, (49) U.S.D.A. 325.
 - clover yields, (50) 334.
 - corn yield, U.S.D.A. (41) 810; (44) 118.
 - critical periods of plant growth, (43) 207.
 - nitrate loss by drainage, (43) 19.
 - oak growth rings, (46) Mo. 16.
 - organic matter in soil, (49) Wash. Col. 211.
 - soil composition, (49) Wash. Col. 211.
 - toxicity of borax, (49) 217.
 - wheat yield, (47) 115, 616.
 - wheat yield in Australia, (43) 208.
- eight-year cycle, (48) U.S.D.A. 114.

Rainfall—Continued.

- estimates, areal, accuracy, (50) U.S.D.A. 114.
- forecasting, (45) U.S.D.A. 319.
- formulas for England and France, (48) 114.
- group distribution and periodicity, (50) U.S.D.A. 415.
- in Arizona, (48) Ariz. 419.
- in Australia, (43) 208, 319.
- in British Isles, (42) 715; (45) 114, 211; (48) 809.
- in British Isles, treatise, (47) 511.
- in California, (43) 209.
- in Chile, (50) 13.
- in Chile, variation, (42) U.S.D.A. 320.
- in cotton belt, (42) 14.
- in Dominica, (42) 510.
- in France, variation with altitude, (41) 119, 419.
- in Hawaii, (41) U.S.D.A. 717, 883.
- in Italy, relation to agriculture, (45) 809.
- in Latin America, (46) U.S.D.A. 619.
- in Mexico, (41) 510.
- in Miami Valley, (45) 586.
- in Montana, (42) Mont. 808.
- in Nebraska, (49) Nebr. 527.
- in 1922, (48) 809.
- in northern and middle Europe, (44) 508.
- in Ohio and Mississippi basins, periodicity, (41) 892.
- in Rhodesia, seasonal forecasting, (48) 509.
- in Saskatchewan, (49) 894.
- in South Africa, (42) 213.
- in South America, forecasting, (43) 418.
- in South Australia, factors affecting, (48) 15.
- in South Dakota, (43) 619.
- in Sweden, (43) 231.
- in Tunis, seasonal distribution, (43) 18.
- in United States, (41) 510.
- in Utah, (43) Utah 230.
- in Virgin Islands, (50) V.I. 511.
- interception by plants, (50) 315.
- map of Africa, (50) 14.
- map of Australia, (50) 616.
- map of South Africa, (47) 616.
- maps of Latin America, (46) U.S.D.A. 619.
- maps of United States, (44) 209.
- measurement, (47) U.S.D.A. 810.
- monsoon, local distribution, (48) 208.
- norms of Brazil, (49) 615.
- observation in Great Britain, notes, (42) 499.
- ocean, (45) U.S.D.A. 17.
- of world, (43) 810.
- on California coast, laws controlling, (47) 810.
- papers on, (43) U.S.D.A. 718.
- reduced, and climate formula, (41) 16.

Rainfall—Continued.

- relation to—
 - alfalfa seed production, (41) U.S. D.A. 732.
 - configuration, (41) 510.
 - cotton, (50) 415.
 - froghopper blight, (42) 510.
 - grazing rate, (43) U.S.D.A. 717.
 - plant diseases, (41) 841.
 - subterranean waters, (49) 789.
 - sunspots, (45) U.S.D.A. 17; (46) 209; (47) U.S.D.A. 414, 629; (49) 615.
 - response in tree growth, (42) 418.
 - seasonal, (46) U.S.D.A. 16.
 - seasonal, forecasting, (48) 114.
 - section in Atlas of American Agriculture, (47) U.S.D.A. 414.
 - summer, daily quantities, (48) U.S. D.A. 714.
 - summer, local forecast studies, (45) U.S.D.A. 318.
 - summer, of United States, (41) U.S. D.A. 809.
- Raisin grapes, drying, factors affecting, (43) Calif. 715.
- Raisins—
 - drying, (41) 557.
 - from wine grapes, (41) 651.
 - process of treating, (42) 804.
 - stemming, seeding, and packing, (43) Calif. 716.
 - sulphuring, (41) Calif. 15.
 - vitamins in, (50) Pa. 463.
- Ram, unilateral cryptorchism in, (49) 463.
- Ramie, analyses, (43) 617.
- Ramie, determination of flexibility, (46) 230.
- Ramphalcyon, taxonomy, (41) 250.
- Rams, selection for studs and flocks, (49) 168.
- Ramularia—
 - aerea, notes, (43) 544.
 - areola, notes, (45) 649; (46) 845; (48) 45.
 - citri, notes, (45) 842.
 - n.spp. on ginseng, descriptions, (41) 155.
 - tulasnei, notes, (48) 842.
- Ranch cost accounting, (46) 893.
- Ranch equipment, (42) Mont. 86.
- Ranching areas, economic study, (48) Tex. 593.
- Ranching, economic aspects, (48) 605.
- Rancidity—*see also* Fats and Oils.
 - analytical detection, (49) 410.
 - studies, (48) 414; (50) 609.
- Range—*see also* Grazing.
 - and pasture management, treatise, (50) 167.
 - cattle, silage for, (41) Ariz. 368.
 - cattle, thistle silage for, (41) N.Mex. 176.
 - conditions in Mexico, (41) 821.
 - country, agricultural conditions in, (47) 296.

Range—Continued.

goats, production, (41) U.S.D.A. 71.
grasses, native, carrying capacity, (41)
434; (48) N.Dak. 69.
management, (41) U.S.D.A. 521, U.S.
D.A. 565; (50) 867.

management—

during drought, (47) U.S.D.A. 468.
factors affecting, (48) 872.
in Philippines, (44) 868.
studies, (44) 866.
plants, poisonous, *see* Plants, poison-
ous.
sheep, emergency feeding, (41) Nev.
271.
stock, emergency feeds, (41) Tex. 70.
studies, (47) Calif. 630.
studies by experiment stations, (48)
601.
utilization, studies, (48) Nev. 171.

Ranges—

carrying capacity, (41) 869.
carrying capacity, effect of grazing,
(49) 30.
oak-brush, (41) U.S.D.A. 191.
of Great Plains, carrying capacity,
(43) 522.

Ranilla disease in Porto Rico, (49) 586.

Ranunculaceae, variation in, (42) 725.

Rape—

as affected by sulphur, (50) Oreg. 724.
as chinch bug control crop, (49) Ill.
431.
as forage crop, (42) Wis. 373; (43)
527.
as hay crop, (48) N.Dak. 226.
as silage crop, (41) 732.
blossom beetle, biology of, (44) 57.
blossom beetle, control, (49) 252.
blossom beetle, studies, (45) 655.
breeding experiments, (44) 632.
cake, analyses, (42) 770.
cake, fertilizing value, (41) 218, 826.
capsules, digestion coefficients, (42)
263.
culture, (43) 638; (44) 436, 632.
culture experiments, (41) Can. 528;
(45) Kans. 33.
dust, fertilizing value, (41) 825; (44)
513.
effect of soil acids on, (42) Wis. 324,
424.
effect on following crops, (44) R.I.
33.
effect on soil reaction, (46) 211.
Erysiphe polygoni on, (45) 351.
feeding value, (46) Iowa 363, Mont.
364; (47) Pa. 474.
fertilizer experiments, (42) Minn.
826; (45) Ill. 121.
for young pigs, (42) Mont. 67.
ground, energy value, (47) 69.
growth in alkali soil, early, (42)
Utah 28.
hogging-off tests, (44) U.S.D.A. 772.
oil, addition to mineral oils, (47) 292.
oil, production, (46) 636.

Rape—Continued.

oil, therapeutic value, (46) 568.
pasture for lambs, (41) Ohio 177, 368.
pasture for swine, (41) Ohio 178, 675;
(50) Can. 371.
pastured-off, effect on following crop,
(41) 826.
phosphorus requirements, (44) R.I. 31.
protein content during growing period,
(41) Iowa 273.
residue, feeding value, (42) 769.
seed cake, energy value, (47) 69.
seed cake, feeding value, (42) 369.
seed, nitrogen and oil in, (47) 128.
seed, oil extraction from, (44) 436.
seed oil production, (43) 234.
seed oil, test, (48) 711.
seeds, iron and manganese content,
(49) 202.
silage for growing pigs, (41) Iowa
273.
silphids on, (46) 51.
sodium for, (41) R.I. 426.
straw, digestibility, (43) 569.
straw, hydrolyzed, feeding value, (48)
265.
sulphur fertilizers for, (41) 427.
use of soil potassium by, (43) 218.
varieties for oil production, (44) 138.
varieties, new, (48) 134.
variety tests, (44) 632; (49) 232.
weevil, notes, (47) 551.
winter, treatise, (43) 234.

Raspberries—

American, origin, (43) 439.
as phytometers, (41) 327.
black, disease control, (49) Mich. 846.
breeding, (49) 236, 436.
breeding experiments, (43) 536, 742;
(44) 145, 533, S.C. 533; (46) 39;
(48) 445.
culture, (41) Mich. 148; (44) Wash.
43; (45) Mo. 641; (47) Minn. 338;
(48) N.Dak. 37; (49) Mont. 136;
(50) 543.
culture and marketing, (43) 40.
culture and propagation, (45) Mo. 238.
culture at high altitudes, (44) Colo.
235.
culture experiments, (44) Alaska 336;
(47) Okla. 830; (49) Alaska 435.
culture in Canada, (46) 234.
culture in Massachusetts, (46) 842.
culture in Minnesota, (41) Minn. 387.
culture on small holdings in Scotland,
(41) 836.
diseases affecting, (44) Calif. 744.
diseases and pests, (45) Mo. 238.
drying, (45) Calif. 808.
effect of temperature on wounding,
(43) U.S.D.A. 39.
fertilizer experiments, (44) Oreg. 835;
(45) 641; (49) Oreg. 742.
hardiness tests, (45) N.Dak. 236.
hardy varieties, (45) 742.
history and development, (48) 737.

Raspberries—Continued.

- in western Washington, (42) Wash. 397.
 - insects affecting, (44) Mo. 754; (45) 655.
 - new or noteworthy, (49) N.Y.State 338.
 - new varieties, (42) 637; (43) 438.
 - potash fertilizers for, (41) Mass. 21.
 - preserving, (45) 665.
 - pruning, (48) Mich. 342.
 - pruning instructions, (45) 44.
 - running-out of, cause, (49) N.Y.State 546.
 - spraying schedule, (44) Mo. 535.
 - storage experiments, (44) Calif. 738.
 - storage studies, (46) 338.
 - storage temperature, (47) Calif. 640.
 - training and harvesting, (44) Wash. 237.
 - varieties, (48) N.Dak. 235; (50) Mont. 139.
 - varieties, classification, (48) 737.
 - varieties for Missouri, (44) Mo. 536.
 - varieties, new, (45) 140.
 - variety tests, (42) Minn. 834; (46) 839; (47) Alaska 534; (49) N.H. 336, Idaho 740.
 - wild, hardness in, (48) 233.
- Raspberry—
- anthracnose, control, (44) Ill. 839; (47) Wis. 446; (49) Wis. 645, Iowa 746; (50) 751.
 - anthracnose, notes, (42) 740; (46) 143.
 - anthracnose, treatment, (41) Iowa 249.
 - beetle, notes, (50) 51.
 - blue stem, notes, (50) 354.
 - buds, cause of failure, (49) 45.
 - cane aphid, description, (50) 454.
 - cane blight, notes, (46) 143.
 - cane blight, transmission, (44) Kans. 249.
 - cane borer, red-necked, (48) U.S.D.A. 254.
 - crown gall, notes, (46) 543; (50) 745.
 - curl, notes, (48) 242.
 - diseases, (47) Mich. 650, Mich. 833; (50) N.Y.State 547.
 - diseases and insect pests, control, (50) West.Wash. 195.
 - diseases, control, (42) Wash. 645; (43) Ill. 847.
 - eastern blue stem on, (47) U.S.D.A. 845.
 - fruit worm, studies, (50) Conn.State 848.
 - gray bark disease, control, (44) Minn. 745.
 - insect pests, control, (42) Wash. 645.
 - insects, notes, (50) N.Y.State 555.
 - juice, desiccated, antiscorbutic value, (46) 359.
 - leaf curl and mosaic, (50) 751.
 - leaf curl, control, (49) N.Y.State 546, Can. 839.

Raspberry—Continued.

- leaf curl, notes, (45) Can. 841; (48) Can. 450; (49) Oreg. 755.
 - leaf rust, notes, (49) 44.
 - mosaic, control, (49) N.Y.State 546.
 - mosaic, notes, (49) Oreg. 755.
 - new fungus disease, (47) 750.
 - orange rust, notes, (44) 54, Conn.State 150; (50) 149.
 - plantations, establishment and care, (49) Oreg. 742.
 - root borer, notes, Oreg. (44) 850; (49) 555.
 - roots, freezing, (44) N.Y.Cornell 821.
 - rosette, control, (49) N.Y.State 546.
 - rust, notes, (49) Oreg. 546.
 - sawfly, notes, (41) Conn.State 159; (44) Oreg. 850; (49) Oreg. 555.
 - shoots, hardness, relation to pentosan content, (46) 443.
 - sirup preparation, (48) Calif. 507.
 - stocks, impurity, (48) 737.
 - streak disease, notes, (49) Oreg. 755.
 - vines, cause of failure, (44) Calif. 744.
 - yellow rust, notes, (46) 143.
- Raspberry-dewberry hybrid, (46) Tex. 335.
- Rat—
- bite fever, summary of information, (42) 846.
 - fleas, Indian, distribution, (47) 252.
 - mite attacking man, (50) U.S.D.A. 159.
 - roof, recessive black variety, (50) 430.
 - surveys and rat proofing, (44) 751.
 - virus investigations, (47) N.Dak. 51.
- Rations—
- calculating, for milk production, (50) 676.
 - in Rumanian Army, digestion experiments, (45) 463.
- Rats—see also Rodents.
- age and chemical development, (50) 569.
- albino—
- adrenalin content of suprarenals, (42) 665.
 - cell division in, (42) 376.
 - changes in weights of organs, (50) 773.
 - development of ovary, (44) 363.
 - effect of alcoholism, (47) 277, 278.
 - effects of diet deficiency on testes, (42) 468.
 - effects of inanition, (42) 664, 665, 666, 667.
 - effects of pituitary gland feeding, (43) 67.
 - effects of thyroid feeding, (42) 666.
 - fertility, effect of alcohol, (48) 366.
 - mammary gland, histology of, (42) 666.
 - mineral content during growth, (48) 464.
 - ratio of cortex and medulla of adrenal gland, (42) 665.

Rats—Continued.

albino—continued.

- recovery of normal weight after underfeeding, (42) 664.
- skeleton growth, studies, (42) 663.
- spermatogenesis in, (42) 376.
- underfed, changes in weight, (42) 468, 664.
- weight of epididymis and other organs, (42) 559.
- antenatal feeding of parents, effect on offspring, (50) 667.
- as enemies of man, (43) 250.
- as enemies of poultry, combating, (47) West.Wash. 549.
- breeding for feeding experiments, (50) 169.
- chronic intoxication of, (45) 280.
- coenurus in, (42) 847.
- control, (45) 551.
- control in field and barn, (48) 250.
- destruction, methods, (48) 150.
- effect of lactation on sexual cycle, (46) 871.
- effect of vitamin A deficient diet, (48) 260.
- entozoa of, (43) 457.
- eradication in Great Britain, (46) 455.
- exhibition standards, (43) 575.
- extermination, (44) 56, 754, 849; (45) 851; (49) U.S.D.A. 351.
- feeding experiments, modification of basal diet, (48) 63.
- field, control in Punjab, (47) 357.
- genetic experiments with, (49) 366, 864.
- glycogen and glucose in muscles, (49) 570.
- gonads, physiological properties, (42) 767.
- growth and weight as affected by thirst, (46) 264.
- heredity of hooded character, (42) 762.
- hermaphroditism in, (46) 265.
- inheritance of size in, (49) 864.
- intravenous administration, (45) 478.
- kangaroo, geographical study, (47) 755.
- kangaroo, notes, (44) Ariz. 548.
- linkage in, (42) 762.
- microorganisms in lungs of, (48) 278.
- Moniliformis species in Texas, (46) 49.
- oestrous cycle in, (42) 667.
- Old English, mutant of, (50) 631.
- piebald, selection experiments, (42) 762.
- plague infected without visible lesions, (50) 151.
- prevention of rickets in, (47) 66, 67.
- protozoal parasites of, (43) 883.
- rate of deposition of strontium, (49) 765.
- relation to disease, (42) 355, 846.
- reproduction in, physiology, (44) 173.
- reproduction on synthetic diets, (48) 757.
- reproductive failure on exclusive milk diet, (49) 663.

Rats—Continued.

- resistance to consecutive injections of strychnin, (46) 655.
- Spirochaeta icterohaemorrhagiae in, (41) 85.
- stock, ration for, (50) 765.
- surveys and rat-proofing, (45) 654.
- susceptibility to infection with Bacillus abortus, (48) 581.
- susceptibility to strychnin, (46) 655.
- toxicity of barium carbonate to, (44) U.S.D.A. 248.
- vitamin A requirements, (47) 169.
- vitamin B storage in, (49) 665.
- wild, in England, parasites of, (48) 549.
- wild, plaguelike organisms in, (44) 183.
- wood, bushy-tailed, of California, (42) 355.
- wood, notes, (42) 748.
- xerophthalmia in, (42) 59.
- Rattans, sources and uses, (48) 239.
- Rattler, small-type, description, (41) 788.
- Revenelia erythrinae n.sp., description, (46) 829.
- Ravenelia spp., notes, (47) 839.
- Ravens in Normandy, (46) 852.
- Raw materials, shortage of, in Europe, (42) 189.
- Rayfish liver oils, alcohols from, (47) 311.
- Razoumofskya spp., biology and significance, (43) 821.
- Reading, increase in metabolism during, (42) 167.
- Reading matter in farm homes, (47) Nebr. 798.
- Reagents—
 - American-made, examination, (44) 9
 - organic chemical, preparation, (44) 802; (46) 414.
 - standards and tests, (45) 109.
- Reaper-thresher, combined, use in Canada, (50) Can. 288.
- Reckziekte in sheep, (41) 873.
- Reclamation—
 - activities of Idaho, (49) 383.
 - and colonization of agricultural lands, economic effect, (48) 196.
 - and irrigation in Argentina, (43) 477.
 - by drainage, proposed law, (47) 287.
 - engineering developments, (50) 99.
 - Federal, problems, (50) 385.
 - history and performance, (50) 482.
 - of arid soils, (50) 420.
 - of mesa lands, plan, (45) Calif. 88.
 - project, Newlands, work, (49) U.S. D.A. 696.
 - project, Orland, concrete lining of canals and laterals on, (49) 685.
 - projects, U.S.D.A. (43) 435; (44) 195, 495, 796; (45) 598; (46) 724, 793.
 - projects, demand for agricultural engineer, (48) 196.
 - projects, extension of construction charges, (50) 385.

Reclamation—Continued.

Service and Bureau of Soils, cooperation, (49) 616.

Service, experimental program, (44) 584.

Service report, (43) 85; (45) 183; (46) 886; (48) 781; (50) 483.

Service, work of, (41) 481.

Reconstruction—

agricultural—

congresses on in France and Belgium, editorial, (42) 701.

in Canada, (41) 792.

in France, (41) 593, 792; (42) 493, 687, 790.

in Great Britain, (41) 92, 792; (48) 791.

in Italy, (41) 793.

in Belgium, (43) 292.

list of references, (41) 387.

place of agriculture in, treatise, (41) 489.

rural, in Bengal, (41) 490.

Recurvaria—

milleri, life history, (45) 255.

nanella, notes, (41) 61; (46) 749; (50) 554.

piceaella, notes, (50) 151.

pinella, notes, (50) 151.

Red bugs—

control, (47) 52, N.Y.State 157, N.Y.State 453, (50) 660.

notes, (42) 647; (45) Conn.State 148; (47) 54, N.Y.Cornell 757; (49) Pa. 251.

Red cedar chests, protection against clothes

moth, (47) U.S.D.A. 162.

Red clover, *see* Clover, red.Red dog flour, *see* Flour, red dog.

Red fever of swine, prevention, (42) 78.

Red gum trees, tapping methods, (46) 341.

Red lead, use in paint, treatise, (46) 688.

Red mite, European—

control, Conn.State (45) 259; (50) 50.

in Connecticut, (46) 753.

new orchard pest, (45) Conn.State 149.

notes, (47) Conn.State 155, 558, Idaho 763; (48) 852; (49) Ohio 352; (50) Conn.State 851.

Red scale—

control, (49) 153.

fumigation, (41) 164; (44) Calif. 751.

Spanish, notes, (45) 853.

Red soils, origin, (46) 621.

Red spider mite—

American and European, (42) 551.

as affected by freeze of 1917, (43) 555.

control, (41) 160; (42) 153; (45) 763, 861; (46) 160, 662; (48) 152, 256, Hawaii 354, 857; (49) Pa. 251, V.I. 352; (50) 844.

imported, on apple foliage, (42) 456.

in deciduous orchards, control, (48) Calif. 460.

Red spider mite—Continued.

notes, (43) 53, 255, 851; (45) 560;

(46) U.S.D.A. 752; (47) 53,

U.S.D.A. 157, 261, U.S.D.A. 359,

Calif. 653; (50) 255.

on cotton, (43) U.S.D.A. 352.

on currants, (42) 748.

on date palm, (45) 552.

on hops, (41) N.Y.Cornell 161.

on poison ivy, (41) 760.

two-spotted, notes, (42) Ariz. 357.

Red spider mites—

new, (45) 656; (47) 558.

new, in Connecticut, (50) Conn.State 50.

new Nearctic, (46) 161.

studies, (46) S.C. 747.

summary, (47) Idaho 762; (49) Oreg. 157.

Redtop—

analyses, (41) Wyo. 333.

and bent grass, distinguishing, (44) 233.

breeding experiments, (50) Can. 433.

culture experiments, (43) Wash. 436.

culture in British Columbia, (42) 733.

description, (42) U.S.D.A. 340.

duration in meadows, (50) N.Y.Cornell 231.

effect on following crop, R.I. (41) 135; (44) 33.

fertilizer experiments, (41) R.I. 135; (42) Minn. 826.

germination as affected by fertilizers, (44) Va. 721.

preparing seed bed on denuded surfaces, (41) Ind. 130.

seed production maps, (41) U.S.D.A. 236.

Reductase—

in pollen, (48) 728.

reaction of milk as affected by Roentgen and ultra-violet rays, (45) 718.

test for milk, (43) 271; (49) 612.

test for milk, limitations, (46) 75.

Redwater, *see* Texas fever.Redwater, Rhodesian, *see* African coast fever.

Redwood—

analyses, (43) 506; (48) 416.

and Douglas fir, fire resistance, (50) 40.

bark, relation to diameter and volume, (50) 744.

identity, (46) 843.

reproduction, (48) 449.

second-growth, volume tables, (46) Calif. 342.

second-growth, yield tables, (49) Calif. 642.

seedlings, notes, (48) Calif. 540.

Reed, composition and digestibility, (45) 168.

Reeds, feeding value, (42) 769.

Reforestation, *see* Forestation.

- Refractive index, test of chemical changes in body fluids, (42) 262.
- Refractometer—
for testing refined oils, (44) 412.
for valuation of sugar beet seed, (46) 807.
- Refrigerating plants, farm, plans, (45) 591.
- Refrigeration—
in transportation of perishable products, (43) 339.
literature of, (42) 589.
mechanical, treatise, (48) 91.
treatise, (44) 487; (47) 892.
- Refrigerator—
car, standard, description, (43) 90.
cars in England, tests, (42) 589.
cars, operation, (48) 91.
for milk, homemade, (44) 88.
for shipping live insects, (50) 657.
iceless, as inoculation chamber, (43) 444.
- Refuse, town, fertilizing value, (49) 215.
- Rehmsdorf organic fertilizer, fertilizing value, (50) 623.
- Reichert-Meissl value as affected by atmospheric pressure, (44) 412.
- Reindeer—
cyst-forming protozoa in, (48) 151.
domestication, (43) 172.
in Alaska, (48) U.S.D.A. 70.
industry in Alaska, (45) 70.
industry in Arctic and sub-Arctic regions, (48) 748.
management, course in, (49) 299.
moss, digestion coefficient, (43) 266.
nomadism, notes, (43) 172.
- Relapsing fever—
causative agent, (47) 681.
of Panama, rat as disseminator, (48) 482.
relation to bedbugs, (50) 53.
transmission by ticks, (46) 682.
- Religion and irrigation, treatise, (48) 494.
- Remedies, new and nonofficial, (41) 781; (43) 470; (46) 880; (47) 383.
- Remigia repanda, notes, (48) 357.
- Rennet—
as affected by heat, (45) 880.
coagulability of remade milk, (47) 111.
efficacy, determination, (45) 880.
extracts, standardization, (48) 176.
in milk, effect on alcohol test, (49) 717.
manufacture, (46) 771.
substitutes in cheese making, (42) 566, Calif. 876.
v. pepsin in cheese making, (44) 274.
- Rennin, action on casein types, (46) 261.
- Rennin and pepsin, comparison, (48) 708.
- Reports, preparation, treatise, (50) 898.
- Reproduction—
effect of restricted diet, (49) 459.
effect of vitamin A deficiency, (50) 60.
in the rat, physiology of, (44) 173.
on synthetic diets, (48) 757.
- Reproduction—Continued.
physiology of, treatise, (48) 661.
unrecognized dietary factor essential for, (48) 864; (50) 261.
- Reproductive—
organs in sterility, pathology, (45) 73.
organs, internal secretions of, (50) 366.
tissues, effect of alcohol on, (41) 862.
- Research—
agricultural, *see* Agricultural research.
data, source book, (49) 392.
importance of administration in, (48) 101.
Institute for New Zealand, (42) 697.
- Reservoirs—
algae growths in, control, (43) 479; (47) 590.
irrigation, leakage, (41) 883.
small storage, construction, (50) 86.
- Resin, formation and flow, factors affecting, (43) 241.
- Resin in turpentine as foam breaker, (41) 410.
- Resinol solution as spray, (45) 655.
- Resins—*see also* Oleoresins.
action of alcoholic potassium hydroxide on, (41) 210.
analysis, (44) 806.
and gums, handbook, (41) 110.
chemistry of, progress, (41) 614.
dark-colored, determination of saponification number, (43) 15.
iron content, (43) 202.
Philippine, notes, (44) 640; (48) 842.
substitutes in Germany, (43) 204.
synthetic, and their plastics, treatise, (49) 207.
- Resistance in animals on deficient diet, serological factors, (49) 584.
- Resorcinol, production, (44) 310.
- Respiration—
and antagonism, studies, (43) 820.
and carbohydrate supply, (45) 334.
and photosynthesis, interrelation, (45) 334; (46) 25.
apparatus, (46) 166.
apparatus, Benedict portable, criticisms of, (46) 260.
apparatus, portable, description, (45) 66.
as affected by high altitudes, (43) 565.
chamber at New Haven Hospital, (43) 370.
chamber for large animals, (43) 266; (44) 5, N.H. 68.
chamber, new and simplified type, (47) 279.
chambers, description, (43) 166.
effect on protein percentage of grains, (49) 821.
experiments with small animals, apparatus, (49) 863.
in apples, (46) 337.
in dormant seeds, (47) 730.

Respiration—Continued.

in plants—

- and animals, studies, (41) 524, 632.
- as source of heat, (43) 819.
- limiting factors, (41) 429.
- measuring, (43) 431.
- parasitized by fungi, (45) 48.
- studies, (41) 28, 329; (43) 820; (47) 426; (49) 728.
- in vitamin deficient tissues, (47) 860.
- measuring, (41) 524.
- method of study in land plants, (42) 730.

- of apple seeds, (48) 624.
- of apples in storage, (50) 542.
- of laminaria, (42) 436.
- of leaves, rate, (46) 25; (48) 825.
- of leaves in vacuum or in scant oxygen, (50) 126.
- of leaves, variation with age, (44) 824.
- of roots, (50) 627.
- of sprouting barley, (46) 224.
- of submerged plants, (49) 423.
- of sweet potato fungi, (45) 355.
- studies, (46) 127; (48) 124, 125, 727.

Respiratory—

- apparatus, self-registering, for determining oxygen absorption, (48) 859.
- disease, treatment, (41) 283.
- exchange and transformations of energy, computing, (47) 666.
- exchange of newborn, apparatus for measuring, (49) 14.
- exchange of poultry during vitamin starvation and polyneuritis, N.Y. State (47) 465, 577.
- metabolism during mental work, (49) 560.
- quotient, in polyneuritis, (44) 172.
- quotient, uncertainty, (46) 70.

Respirometer for seeds, description, (48) 624.

Restaurant economics in England, (43) 663.

Reticulitermes, new species and variety, (43) 256.

Reversion—

- in black currants, (42) 151.
- in composites, (47) 325.
- in Eleagnus, (47) 326.

Rhabdocnemis obscura—

- notes, (41) 660; (45) 359; (46) Guam 748.
- on sugar cane, (43) 52.
- summary, (45) 762.

Rhabdopterus picipes on apples, (44) 854.

Rhacodiella castaneae—

- ascophore form, (47) 541, 548.
- n.g. and n.sp., description, (42) 747.

Rhadinoceraea micans, oviposition and habits, (46) 857.

Rhagium lineatum, notes, (43) N.Y. Cornell 855.

Rhagoletis—

- cerasi or cingulata, *see* Cherry fruit fly.

Rhagoletis—Continued.

- pomonella, *see* Apple maggot.
- ribicola, *see* Currant fruit fly.
- suavis, life history, (46) U.S.D.A. 249.
- suavis pupae living two years, (49) 760.

Rhamnose, preparation, (41) 201; (45) 310.

Rhamnus spp., rôle in crown rust dissemination, (50) U.S.D.A. 43.

Rhenania—

- nitrogen phosphate and ammonium superphosphate, comparison, (50) 817.
- phosphate, fertilizing value, (46) 820.

Rhenish Potato Research Institution, report, (45) 535.

Rheosporangium aphanidermatus—

- notes, (46) 347.
- on pine seedlings, (42) 248.

Rhicnopenella eucalypti n.sp., description, (46) 857.

Rhinanthocyan, studies, (45) 629.

Rhinitis in calves, (48) 282.

Rhinoceros beetle—

- biology, (46) 250.
- in Philippines, (42) 53.
- in Porto Rico, (47) 855.
- injurious to coconut palm, (42) 52; (43) 57; (48) 57.
- larvae, green muscardine fungus on, (49) 255.

morphology and ecology, (46) 560.

studies, (45) 558; (46) 559; (49) 50.

Rhinoeladum corticolum on mango, (50) 150.

Rhipicephalus—

- appendiculatus, life history, (43) 582.
- bursa, notes, (43) 83; (48) 182; (50) 882.
- sanguineus, notes, (43) 83, 84; (48) 279.

Rhizoctonia—

- and Pythium in coniferous seed beds, relative importance, (42) 248.
- as indicator of potash starvation, (42) 122.

control, (48) 245.

crocorum, studies, (48) 456.

disease, new hosts for, (48) 143.

disease, notes, (42) Wash. 397, 740.

goodyerae repentis n.sp., description, (47) 426.

in Porto Rico, (46) 545.

microsclerotia on beans, (47) 247.

on asparagus, (41) 841.

on sugar cane, (42) 643.

solani—

- control, (45) 447, Iowa 648; (47) 353.

immunity of potatoes to, (50) 350.

inoculation experiments, (45) 249.

notes, (42) 243, Hawaii 543; (43) 444; (46) 447, 451, 544; (48) 145, 349; (49) 46, 839.

on carnations, (41) Ill. 752.

on potato, (41) 451.

on tobacco, (43) 246.

Rhizoctonia—Continued.

solani—continued.

on tomato, (43) 154.

physiological specialization, (46) 325.

physiology, (50) 43.

relation to foot-rot of cereals, (42) 351.

sp., notes, (45) 842; (46) 45, 846.

sp. on celery, (41) N.J. 50.

sp. on garden plants, (42) 147.

sp. on greenhouse lettuce, (43) Ky. 845.

sp. on lettuce, (50) 651.

sp. on tomato, (41) 156.

spp., notes, (43) 652; (48) 48; (50) 352.

studies, (41) 543; (43) Wash. 749; (48) Del. 642.

violacea, notes, (43) 347; (44) 447.

violacea on alfalfa, (43) 244.

violacea on asparagus, (45) 542.

Rhizoglyphus—

echinopus, notes, (42) 656; (48) 256.

hyacinthi, studies, (44) Conn.State 857.

rhizophagus on red clover, notes, (42) 743.

Rhizopertha dominica, notes, (41) 759; (43) 253, 254; (47) U.S.D.A. 156.

Rhizopus—

equinus annamensis, notes, (49) 381.

nigricans—

description, (42) 162.

in corn meal, (46) 356.

notes, (46) 447, 647, 846, 847; (47) 152, 242.

on cold storage meat, (47) 560.

on strawberries, (42) 247; (50) 48.

spores, germination, (48) N.H. 544.

spores, longevity, (50) 630.

strains, variations in, (50) 648.

temperature response of, (47) 151.

sp. on tomato, (41) 156.

spp., causing decay of sweet potatoes, (49) 754.

spp., H-ion changes induced by, (50) 21.

spp., notes, (47) 151, 249; (48) 547.

spp. on vegetables and fruits, (50) 749.

spp., pectinase produced by, (46) 325.

spp., temperature relations, (49) 540.

tritici—

enzymes secreted by, (45) 144.

on sweet potato, (45) 749, 750.

on sweet potato, acid production by, (50) 21.

utilization of glucose as source of carbon, (45) 354.

Rhode Island—

College, notes, (43) 600, 700; (46) 198.

Rhode Island—Continued.

Station, notes, (41) 199, 900; (43) 400, 700; (45) 300, 800; (46) 198; (47) 198, 300, 600; (48) 299; (49) 198.

Station, report, (44) 95; (46) 297; (47) 799; (49) 599.

Rhodes grass—

adaptation and behavior, (48) Calif. 527.

as hay crop, (47) U.S.D.A. 430.

as pasture crop, (48) Ariz. 434.

culture, (45) Ariz. 739.

culture experiments, (41) Ariz. 331;

(43) 134; (50) U.S.D.A. 132.

hay, feeding value, (42) Tex. 369.

history, culture, and analyses, (41) U.S.D.A. 337.

variety tests, (43) U.S.D.A. 134.

yield, (48) Ga.Coastal Plain 628.

Rhodnius brethesi n.sp., life history studies, (43) 57.

Rhodnius prolixus, trypanosoma in, (48) 879.

Rhodobaeus 13-punctatus, biology, (49) 56.

Rhodobaeus 13-punctatus, notes, (48) 359.

Rhododendron—

borer, notes, (50) Conn.State 50.

bug, control, (49) 153.

bug, life history and control, (48) 154.

diseases, description, (45) 547.

new species, (43) 838.

poisonous to sheep, (47) 878.

root rot, (46) 150.

seedlings, effect of aluminum sulphate, (48) 839.

Rhodophyllin, oxidation in plants, (42) 528.

Rhogas—see also Rogas.

lefroyi, notes, (45) 658.

Rhopaea spp., notes, (48) 254.

Rhopaea spp. on sugar cane, (43) 52.

Rhopalopsyllus spp., notes, (50) 55.

Rhopalosiphoninus, new genus, erection, (43) U.S.D.A. 758.

Rhopalosiphum—

persicae, notes, (50) 156.

persicae on spinach, (41) Va.Truck 663.

spp., notes, (42) 452.

violae and allied form, (43) 54.

Rhopobota naevana, see Blackhead fire-worm.

Rhotanium laboratory ware, (41) 11.

Rhubarb—

analyses, (43) 63.

Armillaria mellea in, (44) 49.

Botrytis disease, (45) 843.

breeding experiments, (47) Pa. 437.

crown rot, notes, (47) Pa. 445, 544; (48) Pa. 48.

crown rot, summary, (50) Pa. 445.

culture, (41) 739; (44) 796; (47) La. 438.

Rhubarb—Continued.

- culture experiments, (48) Can. 450; (49) Alaska 435.
- determination of acidity, (42) 505.
- diseases in England and Wales, (49) 645.
- leaf spot and rot, (48) 242.
- leaves, feeding value, (42) 369.
- Phytophthora foot rot, description, (48) 453.
- potash fertilizers for, (41) Mass. 21.
- root rot, notes, (43) 243.
- seedlings, studies, (44) Pa. 740.
- varieties, variation in, (43) Pa. 537.

Rhynchites—

- bicolor, notes. (44) 352.
- conicus, notes, (44) 760.
- tristis, papers on, (50) 256.

Rhynchophora on sweet potatoes, (43) 163.

Rhynchophorus ferrugineus, notes, (45) 859.

Rhynchophorus schach, summary, (49) 855.

Rhynchoporus—

- on Dactylis and Bromus, (47) 247.
- secalis, notes, (44) 539; (47) Calif. 648; (48) Calif. 545.

Rhynchotha, key, (44) 451.

Rhyphidae, anomalous dipteran of, (45) 361.

Rhyphidae, studies, (42) N.Y.Cornell 157.

Rhyphus punctatus, chemotropic response, (43) 554.

Rhyssella, new genus, erection, (43) 857.

Ribes—see also Currants, Gooseberries, etc.
as affected by Cronartium ribicola, (50) 656.

- blister rust on, (44) Conn.State 150.
- eradication, (41) 351, 352; (44) 54, 347.
- eradication by chemicals, (43) 246, 248, 249.

rusts, studies, (42) Conn.State 247.

Ribs, scorbutic beading of, (43) 369.

Rice—

- acreage and planting time, (44) P.R. 433.
- afterripening and germination, (42) 35.
- alcohol from, (47) 207.
- and by-products, feeding value, (48) Calif. 571.
- and by-products for swine, (49) 863.
- and by-products, utilization, (41) 533; (44) 831.
- as affected by climatic conditions in Philippines, (41) 643.
- as affected by salt in irrigation water, (44) La. 38.
- as food, (45) U.S.D.A. 260.
- as wheat substitute, (44) U.S.D.A. 761.
- beans as green mulch for bananas, (43) 532.
- blast, notes, (41) 749; (42) 145; 741; (43) 444; (45) 48; (46) 448.
- borer, control, (46) 458.
- borer, notes, (47) 256, 357.
- borer pests of, (45) 359.

Rice—Continued.

- borer, studies, (50) 756.
- bran adulteration, (50) Mich. 714.
- bran, analyses, (41) Ind. 564; (42) Tex. 769; (43) Ky. 373, Ind. 867; (44) 267; (45) Tex. 68, N.J. 775, 872; (46) Mich. 168, Tex. 675; (47) Tex. 475.
- bran, digestibility, (47) Tex. 472.
- bran, feeding value, Tex. (42) 369; (47) 474.
- bran for fowls, (42) Calif. 871.
- bran, phytin content, (47) 366.
- bran proteins, nutritive value, (50) 267.
- bran vitamin, extraction methods, (44) 171.
- breeding experiments, (44) 137, 436, 633; (46) 134, 634; (48) P.R. 227, 434, 629, 830; (49) Tex. 429, 735; (50) P.R. 533.
- brown spots on glumes, (50) P.R. 547.
- brusone, notes, (49) 844.
- bug, life history and control, (46) 458.
- bug, notes, Guam (45) 55; (46) 748.
- bug, summary of information, (43) 556.
- by-products, analyses, (41) Can. 565.
- chlorosis, (44) 243; (48) P.R. 245.
- chlorosis, effect of nitrogenous fertilizers, (49) 754.
- continuous flooding, (47) Calif. 631.
- corn rootworm affecting, (43) U.S.D.A. 253.
- correlation among pure lines, (50) 430.
- cost of production, (44) La. 335; (46) 89.
- cracked, analyses, (46) Tex. 675.
- cultivation, mechanical, experiments, (43) 484.
- culture, (48) 733; (50) 32.
- culture—
 - by the Chinese, (50) 235.
 - experiments, (41) Hawaii 137, 529, 829; (42) 132, 436; (44) 137, P.R. 231, 436, 527, 632, 633, 733; (45) 34, 35, 340, 532; (46) 131, 226, 227, 436, 437; (48) 434, Calif. 528, 629, 830; (49) Calif. 34, Tex. 429; (50) 28.
 - in Argentina, (41) 533.
 - in Bali, (41) 643.
 - in Brazil, (47) 37.
 - in British Guiana, (43) 532.
 - in Burma, (41) 529; (42) 436.
 - in California, (44) U.S.D.A. 529.
 - in Ceylon, (41) 529.
 - in Colombia, (46) 391.
 - in India, (44) 636; (46) 231.
 - in Philippines, (45) 635.
 - in Rhodesia, (44) 436.
 - in Tucumán, (41) 643.
 - in Uganda, (42) 32.
 - methods, (46) Hawaii 633.

Rice—Continued.

- culture—continued.
 - modern methods, (44) 436.
 - station in Italy, (47) 195.
 - tenggala system, (49) 529.
- damage from various causes, (44) U.S.D.A. 118.
- detection in feeds, (50) 468.
- digestibility coefficients, (48) 574.
- disease survey in India, (46) 544.
- diseases and pests, (44) 436; (47) 541.
- diseases, experimental, in humans, (48) 658.
- diseases, notes, (41) 841; (44) La. 334; (45) 650.
- effect on blood regeneration, (44) 565.
- effect on metabolism in paramecium, (42) 662.
- effects of fertilizers, (50) P.R. 550.
- experiments, (45) 33.
- experiments in California, (49) U.S.D.A. 433.
- experiments in Indo-China, (49) 736.
- false smut, notes, (45) 843.
- feed meal, energy value, (47) 69.
- fertilizer experiments, (41) Hawaii 148, 529, 814, 816; (42) 132, 436; (43) Tex. 229, 425; (44) 137, La. 334, 436, 632, 633, 733; (45) 34, Guam 34, 35, 516, 532, 622; (46) 131, 227, Tex. 328, 437, 634, Guam 726; (47) 815; (48) P.R. 229, 434, 629, 830; (49) Guam 427, Tex. 429, U.S.D.A. 433; (50) 28.
- field experiments, technique, (48) 733.
- fields, decomposition of *Astragalus sinicus* in, (46) 715.
- fields, relation to mosquitos, (44) 758.
- fields, weed control in, (41) Tex. 38.
- floating, culture in Cochin China, (44) 636.
- flour, characteristics and detection, (41) 467.
- flour, detection, (46) 13.
- flour, phytin content, (47) 366.
- flowers, sterility in, cause, (50) 23.
- fly, control, (50) 455.
- for fowls, (42) Calif. 871.
- from Kamerun, analyses, (42) 531.
- green manuring experiments, (49) 725.
- ground rough, feeding value, La. (45) 68; (47) 471.
- Growers' Association, report, (50) 793.
- helminthosporiose, studies, (50) 246.
- Helminthosporium disease, (48) 349.
- hulls, analyses, (42) Tex. 769; (45) 872.
- hulls, digestibility, (47) 70.
- hulls, feeding value, (42) Tex. 369.
- hulls for decolorizing carbon, (41) La. 416.
- hybrids, flowering date, (49) 734.
- Ilocano and Tagalog, (41) 337.
- improvement, (45) 228.
- improvement in Bengal, (50) 828.

Rice—Continued.

- improvement in India, (41) 522, 529.
- in Indo-China, production and improvement, (45) 343.
- Indian, trade in, (44) 831.
- inheritance of—
 - beardedness, (48) 34.
 - characters in, (49) 34.
 - color characters, (48) 34.
 - glume color in, (47) 36.
- insects affecting, (41) 354; (42) Guam 53, 451; (43) 52, 252, U.S.D.A. 252; (44) 250, La. 334; (50) 51, 153.
- insulin in, (50) 767.
- irrigation experiments, (44) 136, P.R. 231, Calif. 282, Calif. 731; (45) Tex. 229; (49) U.S.D.A. 433.
- irrigation, rôle of tides in, (43) 689.
- kernel weight, factors affecting, (45) 40.
- leaf folder, notes, (45) Guam 55.
- leafhoppers—
 - life history and habits, (44) 58.
 - notes, (45) 656; (47) 254.
 - parasites of, (43) 857.
- lowland, natural hybrids in, (49) 633.
- manuring in Egypt, notes, (42) 234.
- meal, analyses, (42) 769; (44) 267; (45) 872.
- meal, feeding value, (43) 172; (44) 267; (48) S.C. 69.
- meal v. oats as cattle feed, (43) 172.
- mechanical cultivation, (45) 590.
- milled, grades, U.S.D.A. (44) 39; (50) 193.
- milled, proposed standards, (43) U.S.D.A. 830.
- Millers' Association, statistics, (46) 441.
- moth, studies, (41) U.S.D.A. 459.
- mutation and inheritance of semisterility in, (50) 330.
- natural and polished, analyses, (45) 561.
- neuritis and beriberi, (50) 668.
- nickel and cobalt in, (49) 520.
- nutritive value, (42) 457.
- origin and history in Egypt, (47) 827.
- parasitic fungi in relation to manures, (50) 42.
- pests in Philippines, (46) 457.
- phosphoric acid source, from Trichinopoly phosphate, (49) 123.
- plant, life history, (48) 230.
- polish, analyses, (42) Tex. 769; (44) 267; (45) Tex. 68, 872; (46) Tex. 675.
- polish and tankage v. corn and tankage for pigs, (50) Miss. 69.
- polish, effect on butterfat, (44) 573.
- polish for fowls, (42) Calif. 872.
- polished, effect on beriberi, (42) 457.
- polished, effect on testicles, (42) 865.
- polishings, vitamin B content, (49) 857.

Rice—Continued.

- polishings, vitamin extraction from, (50) 506.
- pollen, detection of segregation, (48) 28.
- popped, analyses, (47) Calif. 660.
- prairie, culture, (43) U.S.D.A. 139.
- production—
 - effect on alkali content of soil, (48) Calif. 516.
 - factors affecting, (45) P.R. 635.
 - in Brazil, (43) 292.
 - in British Empire, (44) 831.
 - in Japan, (46) 533.
 - in Malaya, (50) 536.
 - in Mexico, (46) 33.
 - in United States, statistical study, (49) U.S.D.A. 389.
- purple, inheritance of leaf color, (50) 330.
- red worms, notes, (45) 657.
- root rot in Java, (45) 847.
- rotation experiments, (44) La. 334, 632; (45) 35, 532; (46) 437; (48) 629.
- rough, analyses, (42) Tex. 769.
- rough, grading and marketing, (50) U.S.D.A. 193.
- salt requirements, (45) 527.
- Sclerotium disease, (48) 846; (50) 243.
- Sclerotium diseases, (45) 749.
- screenings, analyses, (45) Tex. 68.
- seed bed irrigation, (49) 633.
- seed bed, temperature, (49) 632.
- seed selection tests, (50) 28.
- seed, wild, studies, (50) 338.
- seeding experiments, (43) Tex. 229; (49) U.S.D.A. 433.
- seedling blight, control, (48) U.S.D.A. 349.
- seedlings, growth, (46) 636.
- selection experiments, (41) 533, 636, 639, 829; (44) 633; (46) 232.
- selection under irrigation, (45) 536.
- sesame spot disease, (50) 654.
- soils—
 - and irrigation water, (49) Calif. 34.
 - decomposition of organic nitrogen in, (50) 815.
 - effect of phosphates with green manure, (44) 129.
 - fertility and titration curves, correlation, (48) 213.
 - mechanical tillage, (48) 684.
 - of Ceylon, studies, (49) 322.
 - of India, fertilizer requirements, (41) 814, 816.
 - of India, studies, (41) 720.
- stack burn, control, (48) U.S.D.A. 349.
- stalk borer, notes, (43) U.S.D.A. 253.
- starch, action of enzymes on, (41) 409.
- starch manufacture from, (46) 508.
- starch, microphotograph of, (48) 708.
- starch, raw, digestibility, (44) 859; (47) 763.

Rice—Continued.

- statistics, (41) 826; (42) U.S.D.A. 731.
- stem borer, control, (49) 556.
- stem borer, monograph, (42) 55.
- stem borer, notes, (43) 52; (46) 458.
- sterility in, (50) P.R. 551.
- straighthead, control, (45) U.S.D.A. 247.
- straw as mulch for sugar cane, (43) 532.
- swarming caterpillar, life history and control, (44) 353.
- tillering studies, (45) 535.
- transplanting in Egypt, (41) 533.
- ufra disease, (41) 64, 543; (42) 145; (43) 444, 652; (44) 445; (45) 48.
- Ustilaginoidea sp. affecting, (43) 45.
- var. plena, experimental evolution, (41) 735.
- variation and correlation of characters, (47) 36.
- varietal characters, group inheritance, (47) 32.
- varieties in India, (44) 636.
- varieties in Philippines, (47) 827.
- varieties, new, (48) U.S.D.A. 531.
- variety and selection tests, (42) 132.
- variety tests, (41) 528, 529, 829; (42) 436; (43) Tex. 229; (44) 136, 137, P.R. 231, 436, 632, 633, 733; (45) 34, 35, 532; (46) 131, 227, 437, 634; (48) 434, 629, 830; (49) Guam 427, Tex. 429, U.S.D.A. 434; (50) 28, S.C. 637, 828.
- variety tests, probable error in, (45) 342; (50) 536.
- vitamin B content, (47) 62.
- water weevil, notes, (43) U.S.D.A. 252; (44) La. 334.
- weed pests, eradication, (44) La. 334.
- weeds, notes, Calif., (49) 34, 229.
- weeds, root excretion, effect on rice, (50) 832.
- weevil—
 - affecting stored corn, (44) 760.
 - as affected by air-tight storage, (43) 254.
 - biology, (50) 255.
 - control, (42) Ala.Col. 848.
 - notes, (41) 758; (42) Calif. 848; (43) 563; (44) 659, Ala.Col. 751; (48) Hawaii 355.
 - paper on, (43) 51.
 - parasite of, (49) 256.
 - summary, (47) U.S.D.A. 156.
 - vitality and rate of increase, (43) 254.
- wild, culture and germination studies, (43) Can. 335.
- wild, descriptions and use, (47) U.S. D.A. 737.
- wild, notes, (50) Minn. 160.
- wild, of India, classification, (46) 33.
- wild, popular account, (44) 231.

Rice—Continued.

- world's production and consumption, (42) 439.
- worm, studies, (41) 64.
- yield as affected by nitrogenous salts, (44) 830.
- yield, factors affecting, (42) 720.
- yield, forecasting in Japan, (45) 113.
- Ricebird, injury to crops, (48) Hawaii 355.
- Ricebird, range and economic status, (41) 547.
- Ricin, detection in feeding stuffs, (45) 413.
- Ricin, limits of agglutination test for, (49) 14.
- Ricinodendron rautanenii for paper making, (42) 531.
- Ricinolein, action of phosgene on, (47) 716.

Rickets—

- and fat starvation, (45) 865.
- and vitamin A deficient diet, (46) 165.
- as a deficiency disease, (43) 166.
- as affected by parathyroidectomy, (48) 466.
- beading of ribs in, (43) 369.
- calcium absorption in, (42) 556, 661.
- cause and treatment, (42) 367, 462.
- cause, rôle of parental nutrition, (50) 165.
- changes in temporal bones in, (49) 462.
- cure by sunlight, (46) 165.
- development, determining factor, (46) 868.
- diagnosis and incidence, (48) 658.
- diagnosis, value of craniotabes in, (43) 369.
- dietetic production and prevention, (45) 767; (46) 165.
- diffusible calcium of blood serum in, (46) 203.
- effect on weight of organs of rats, (50) 566.
- etiology, (46) 360, 869; (47) 80, 270, 271, 567, 770; (49) 365.
- experimental, present status, (48) 865; (49) 263.
- experimental, studies, (45) 368; (46) 471, 472, 473, 568; (48) 563, 564, 761; (50) 63, 670.
- in breast-fed infants, relation to phosphate in milk, (47) 770.
- in dogs, phospholipin of blood and liver in, (48) 65.
- in infants, etiology, (48) 64.
- in pigs, (50) 266.
- in pigs, effect of diet, (48) 73.
- in rats, (48) 363, 364, 365.
- in rats, prevention, (47) 66, 67.
- in Vienna, studies, (50) 567.
- inorganic phosphate of blood in, (47) 467.
- kinds of, (47) 567.
- light waves in relation to, (49) 65, 365.
- notes, (41) 858; (42) 463; (44) 361.

Rickets—Continued.

- pancreatic disorder in, (47) 665.
 - pathogenesis and treatment, (47) 467.
 - phosphoric acid in blood in, (50) 772
 - prevention and cure by—
 - carbon arc light, (47) 665.
 - different light rays, (48) 365.
 - sunlight, (47) 66, 67, 270, 271, 566, 770; (48) 65, 66, 365.
 - prevention by mercury vapor quartz lamp, (46) 869; (47) 567.
 - production, acid base ratio of diet, (49) 65.
 - relation to calcium and phosphorus in serum, (46) 165.
 - relation to vitamin A, (42) 461; (46) 64; (49) Wis. 664.
 - review of literature, (50) 772.
 - rôle of cod liver oil in, (47) 369.
 - seasonal variation, (46) 164.
 - spontaneous cure in rats, (47) 369.
 - spontaneous, in rats, (50) 165.
 - studies, (41) 364, 365; (43) 264, 664; (46) 669; (47) 65, 66, 67, 270, 271, 565, 566, 567.
 - symposium on, (49) 64.
 - ultra-violet light treatment, (47) 770; (50) 669.
 - value of egg yolk in, (50) 165, 166.
 - X-ray diagnosis, (48) 65.
- Rickets-producing effect of thyroid, (49) 65.
- Rickettsia—
- distribution in insect tissues, (49) 252.
 - lectularia n.sp., description, (45) 161.
 - pediculi and quintana, identity, (45) 553.
 - prowazeki, infection of lice with, (48) 150.
- Riggs, W. M., biographical notes, (50) 5.
- Rinderpest—
- antiserum manufacture in Philippines, (48) 581.
 - antiserum, preparation, (47) 385.
 - antiserum, use in the field, (48) 582.
 - control, (45) 177; (48) 878.
 - control in Egypt, (41) 682.
 - cutaneous lesions in, (48) 179.
 - hyperimmunization, (45) 883; (46) 682.
 - hyperimmunization, anaphylaxis in, (46) 881.
 - immunization, (41) 478, 577, 682, 876; (42) 568, 675; (45) 76, 684; (46) 683; (47) 183, 386, 485.
 - immunization, oral route for, (50) 478.
 - in Africa, (42) 678.
 - in Belgium, (44) 680; (45) 581; (46) 580, 773.
 - in camels, (41) 86.
 - in West Africa and Poland, (46) 580.
 - inheritance of immunity, (43) 583.
 - inoculation method, (46) 481.
 - introduction into Belgium, (45) 181.
 - outbreak control in Brazil, (46) 683.

Rinderpest—Continued.

- outbreak, control in Bulgaria, (45) 282.
- serum, preparation in Poland, (46) 279.
- serum producing cattle, iseanaphylaxis in, (49) 884.
- serum production, (47) 82.
- serum, rapid production of, (46) 376.
- studies, (46) 82; (48) 579; (49) 179.
- summary, (46) 279.
- transmission by bloodsucking insects, (47) 585.
- treatment, (41) 185, 577.
- vaccination experiments, methods, (42) 568.
- virus, cultivation in vitro, (50) 480.

Ring disease of potato, prevention, (42) 743.

Ringling, effect on set of apples, (50) 299.

River—see also Stream flow.

- discharge, formulas, (42) 573.
- discharge, gauging, (48) 681.
- discharge measurements, improvement, (46) 886; (48) 781.
- overflow prevention and drainage, (47) U.S.D.A. 187.
- sediment, content and value, (50) 213.
- stages, daily, at gauge stations, (46) U.S.D.A. 688.

Rivers, self-purification, (44) 186.

Roach, German, notes, (47) Conn.State 156.

Road—

- accident map of Maryland, (46) U.S. D.A. 86.
- aggregates, proportioning with pit run gravel, (44) 483.
- assessments, primary and secondary, (46) 779.
- Bates experimental, (46) 889.
- Bates experimental, report, (46) U.S. D.A. 86.
- conditions, determining from rainfall data, (43) U.S.D.A. 117.
- conditions in Great Britain, (44) U.S. D.A. 189.
- contracts, modification, (44) U.S.D.A. 884.
- coverings, studies, (42) 279.
- development in California, (43) 889.
- grades, economics of, (50) 886.
- grading for snow removal, (45) U.S. D.A. 189.
- grading with tractors, (45) 688.
- law in Louisiana, (43) 85.
- laws in Connecticut, (42) 482, 483.
- laws in Idaho, (42) 577.
- laws in Kansas, (42) 483.
- laws in Kentucky, (50) 587.
- laws in Oregon, (42) 483, 683.
- maintenance, organization, (44) U.S. D.A. 884.
- maps for public use, (43) U.S.D.A. 387.

Road—Continued.

- markers in Maryland, (45) U.S.D.A. 790.
- material, abrasion test, (44) U.S.D.A. 85.
- material standards, (46) 285.
- materials—
 - along St. Lawrence River, (44) 686.
 - bituminous, consistency of, (43) U.S.D.A. 387.
 - bituminous, testing, (41) 789.
 - bituminous, treatise, (43) 186.
 - bituminous, ultramicroscopic examination, (41) 688.
 - for New York State, (42) 781.
 - handling, (42) U.S.D.A. 780.
 - in Kansas, (50) 484.
 - in Mississippi, (44) 685.
 - in Nebraska, (44) 685.
 - in Saskatchewan, (42) 485.
 - in Washington, (42) 578.
 - limestone rock asphalt tests, (41) 884.
 - project, (49) Colo. 588.
 - sampling and testing, U.S.D.A., (45) 487, 891.
 - selection, (47) 90.
 - tests, (41) 484, U.S.D.A. 688, 787, 788, 789; (42) 890; (43) U.S.D.A. 387, 482, 889; (46) 381; (48) U.S.D.A. 884.
 - tolerance of sand in, (46) U.S.D.A. 187.
- oil, laboratory tests, (42) 890.
- oils, asphalt content, (43) U.S.D.A. 689.
- Pittsburgh test, results of heavy traffic, (47) 591.
- roughness, factor in pavement life, (50) 886.
- stone, crushed, commercial sizes, (41) U.S.D.A. 382.
- stone, impact tests for, (42) 891.
- subgrade materials, physical properties, (48) 782.
- subgrade, effect of capillary moisture on, (45) U.S.D.A. 290.
- subgrades, studies, (45) 184.
- surfaces—
 - bituminous, efficiency, (41) 688.
 - bituminous, use in Ohio, (42) 892.
 - design, (43) U.S.D.A. 387.
 - inclined planes instead of curves, (42) 684.
 - structure, (48) 384.
- temperatures, comparison of subgrade and air, (42) 484.
- tests, winter, results, (49) 887.
- traction, mechanical, types of vehicles, (43) 484.
- transportation, excess lift, (44) 686.
- vehicles, taxation and regulation in Great Britain and Ireland, (48) 588.
- width, optimum, (42) 891.
- work, winter, (43) U.S.D.A. 689.

Roads—*see also* Pavements.

- accelerated wear tests, (45) U.S.D.A. 487.
- administration, (43) U.S.D.A. 387.
- administration in—
 - Alaska, (47) 188.
 - Argentina, (43) 388.
 - Arkansas, (44) 884.
 - California, (42) 890; (45) 587, 689; (48) U.S.D.A. 588; (49) 384.
 - Canada, (44) U.S.D.A. 382.
 - Connecticut, (43) 481.
 - France, (44) U.S.D.A. 84.
 - Georgia, (42) 483; (45) 689.
 - Great Britain, (44) U.S.D.A. 189.
 - Iowa, (42) 483.
 - Kansas, (43) 889.
 - Louisiana, (43) 85; (48) 287.
 - Maryland, (46) 489.
 - Massachusetts, (42) 483; (47) 289.
 - Michigan, (42) 483; (43) 481.
 - Minnesota, (43) 591.
 - Missouri, (44) 884.
 - Nevada, (42) 385; (45) 184.
 - New Hampshire, (42) 385; (45) 588.
 - New Mexico, (42) 572; (45) 389.
 - New York, (42) 385; (43) 890.
 - North Carolina, (44) 484.
 - Ontario, (46) 585.
 - Oregon, (42) 683; (45) 184.
 - Texas, (45) 689.
 - Utah, (42) 385.
 - Vermont, (43) 591; (45) 588.
 - Victoria, (42) 577.
 - Virginia, (43) 890.
 - Washington, (45) 390.
 - West Virginia, (44) 784.
 - Wisconsin, (42) 279; (44) U.S.D.A. 189.
- and loads, (44) 284.
- and pavements, rural, treatise, (45) 790.
- and pavements, treatise, (42) 279.
- Arlington, investigations, results, (48) 884.
- Belgian, traffic report, (44) U.S.D.A. 586.
- bituminous macadam and concrete, (45) U.S.D.A. 487.
- brick, rolled-base, (46) U.S.D.A. 285.
- British, classification, (45) 290.
- classification, (42) 577.
- classification by Bureau of Public Roads, (43) 284.
- concrete, *see* Concrete roads.
- construction, (42) 482, 683.
- construction—
 - and inspection in Iowa, (44) 379.
 - and maintenance, (41) U.S.D.A. 380, U.S.D.A. 690; (42) 891; (43) U.S.D.A. 186, 481.
 - and maintenance in Illinois, (45) U.S.D.A. 81.

Roads—Continued.

- construction—continued.
 - and maintenance, motor vehicle's share, (43) U.S.D.A. 186.
 - asphalt in, (42) U.S.D.A. 780.
 - contract bonds for, (43) U.S.D.A. 387.
 - cooperation of railroads, (43) U.S.D.A. 186.
 - estimates, (44) U.S.D.A. 884.
 - experimental, tests, (44) 85.
 - field manual, (43) 284.
 - handling Federal equipment, (43) U.S.D.A. 591.
 - in Canada, (49) 285.
 - in Illinois, (44) U.S.D.A. 189.
 - in Michigan, (42) 385.
 - in Peru, (50) 887.
 - in the Ozarks, (43) 481.
 - problems and materials, (42) 385, 683.
 - relation to highway research, (50) 789.
 - specifications, (42) 485.
 - standard form in requesting bids for, (47) 686.
 - surplus war materials for, (43) U.S.D.A. 591.
 - treatises, (43) 481; (44) 284, 784; (45) 688; (50) 286.
 - use of calcium chlorid in, (47) 188.
 - use of machinery in, (42) 580.
 - use of marl in, (50) 386.
 - value of top soil as base, (43) 185.
 - vertical curves, short method of computing, (43) 284.
 - with army materials, (46) U.S.D.A. 285.
- corrugation, causes and effects, (48) 384.
- country, foundation types for, (43) 85.
- county, laws in Ontario, (42) 483.
- county, variable designs for, (42) 684.
- cross sections, method of computing, (43) U.S.D.A. 388.
- crushed stone and gravel, (45) U.S.D.A. 290.
- curve computations, table for, (42) 684.
- curves, laying out, U.S.D.A. (44) 484, 585, 586.
- distribution of wheel load on, (47) 591.
- drainage structures, design, (43) U.S.D.A. 387.
- educational conference on, (44) U.S.D.A. 189.
- Federal aid types, (43) U.S.D.A. 790.
- Federal aid work, growth of, (42) U.S.D.A. 780.
- for motor truck traffic, U.S.D.A. (42) 780; (44) 884.
- grade design and location, effect on motor operation costs, (44) 86, 784.
- grades and fuel consumption, (48) 783.

Roads—Continued.

- grades, economic theory, (48) 783.
- grading costs reduced by tractor hauling, (48) 783.
- grass, injury from mole crickets, (43) 53.
- gravel, construction and maintenance, (48) 681.
- guard fence for, (45) U.S.D.A. 790.
- hard-surfaced, relative tractive resistance, (42) 578.
- impact strain gauge, (49) 384.
- impact tests, (42) 577.
- impact tests of auto trucks, (41) U.S. D.A. 689.
- impact tests, present status, (42) U.S. D.A. 780.
- improved, economic value, (42) 484; (43) 284.
- improved, value as shown by gasoline consumption tests, (42) 483.
- improving in Maryland, (44) U.S.D.A. 382.
- in California, (45) U.S.D.A. 81.
- in the national forests, U.S.D.A. (43) 442, 790.
- inspection, handbook, (42) 891.
- Iowa, tonnage of traffic, (43) 284.
- load limitations, (44) U.S.D.A. 884.
- macadam and gravel, bituminous treated, (43) U.S.D.A. 689.
- macadam, surface treatment, (42) 280.
- maintenance, comparative costs, (42) 484.
- maintenance costs in Washington, (42) 484.
- maintenance equipment in New York, (42) 683.
- maintenance in England, (44) U.S.D.A. 189.
- monolithic brick, tests, (42) 484.
- papers on, U.S.D.A. (43) 186, 387, 591, 689, 790; (45) 81, 290, 487, 587, 790; (46) 86, 186, 285, 489.
- papers on, (44) 84, 189, 382, 586, 785, 884.
- paved, value to Los Angeles, (42) U.S.D.A. 780.
- public, U.S.D.A. (42) 83, 780.
- public, in Quebec, historical development, (43) 85.
- relation between loads and grades, (42) 484.
- relation to motor truck operating cost, (43) 85.
- rural, design, (42) 484.
- sand, tar, and hay for covering, (42) 279.
- secondary type, construction and maintenance, (49) 687.
- sedimentary, weight per unit volume, (49) 510.
- State, in 1920, (44) U.S.D.A. 884.
- State, mileage and expenditures, (44) U.S.D.A. 382.

Roads—Continued.

- subgrade bearing power, testing, (46) 87.
- subgrade investigations, (43) U.S.D.A. 591.
- subgrade testing apparatus, (45) 390.
- subgrades and foundations, (44) U.S.D.A. 884.
- tar treatment, specifications, (46) 859.
- tractive resistance, effect of in terms of gasoline consumption, (41) 486.
- traffic endurance test in Illinois, (45) 891.
- turnpike, in New England, (42) 891.
- vertical curve formula, solution, (46) U.S.D.A. 285.
- widening and superelevating curves, (44) 382.
- Robins, winter and summer, (43) Ohio 331.
- Robusta coffee as food substitute, (46) 755.
- Robusta coffee, characteristics and use, (47) 313.
- Rock—
 - at Iron Canyon dam site, bearing capacity, (43) 889.
 - blasting, dynamite for, (43) 480.
 - for road building, *see* Road materials.
 - gardens and alpine plants, treatise, (48) 840.
 - gardens, treatise, (45) 441.
 - phosphate, *see* Phosphate.
- Rocks—
 - chemical analysis, manual, (41) 112.
 - effect on forest soil, (47) 118.
 - solubility, rate and extent, (45) Mich. 618.
- Rodent—*see also* Rats, Mice, *etc.*
 - botfly, studies, (41) 258.
 - mountaineers, (42) 747.
 - pests, notes, (50) 151.
 - pests of Wyoming, summary, (50) 151.
- Rodents—
 - control, (41) 353; (45) U.S.D.A. 754.
 - control in Oregon, (49) 756.
 - in Australia, internal parasites of, (43) 457.
 - in orchards, control, (50) 844.
 - new, from Oregon and Nevada, (46) 456.
 - poison baits for, (45) 550.
- Roentgen rays—
 - effect on rickets, (48) 365.
 - effect on trichinae, (45) 182.
 - effect on X chromosomes, (46) 673; (47) 68; (50) 226, 529.
 - production of nondisjunction by, (47) 67.
 - use against plant diseases, (50) 345.
- Roestelia cancellata—
 - immunity of pear variety to, (43) 753.
 - notes, (42) 50.
- Rogas—*see also* Rhogas.
 - hyphantriae n.sp., description, (48) 59.
- Roller, stone, for thrashing sorghum, (42) 893.

Roller tests, (42) 185.

Rondaniella n.spp., enemies of hop aphid and artichoke macrosiphon, (41) 455.

Roof rat, recessive black variety, (50) 430.

Roofing—

materials, (46) Iowa 383.

prepared, studies, (49) Iowa, 788.

tiles, manufacture on the farm, (49) 790.

Roofs, weaveshed, fungi causing decay, (42) 249.

Rook, economic position, (41) 454.

Rook, generic name, (41) 250.

Root—

absorption from solutions at minimum concentration, (41) 132.

adaptation to deficient soil aeration, (46) 25.

and stalk rots, control, (50) 546.

and stem tips, excised, cultivation under sterile conditions, (49) 627.

and storage cellars for Canada, (47) 489.

aphids, notes, (41) 59.

auxanometer, (45) 221.

cellars, concrete, construction, (43) 90.

cells, size, relation to age, (49) 424.

cork in plants, ecological significance, (43) 732.

Root crops—

as affected by phosphatic slag, (48) 122.

as affected by weather, (49) 115.

breeding experiments, (44) 632; (49) Can. 734; (50) Can. 433.

crops, culture, (45) 340, 532, 630.

culture and use in Australia, (47) 227.

culture experiments, (41) Mich. 636;

(43) 528, Minn. 823; (44) 632,

Oreg. 826; (46) 131; (48) 629;

(49) Can. 734.

culture experiments in Ontario, (41) 333.

culture experiments in Philippines, (41) 650.

culture in Cyprus, (44) 137.

culture in Malaya, (48) 732.

culture in Nigeria, (43) 637.

culture in Sweden, (46) 533.

diseases, (42) 541.

effect on following crop, (41) 228, 229.

feeding value, (48) 769.

fertilizer experiments, (44) 632.

for northern Minnesota, (47) Minn. 334.

notes, (47) Alaska 527.

paper on, (43) Wash. 197.

pollination studies, (48) 736.

production and utilization, (45) Wis. 229.

production in Cuba, (42) 31.

rotation experiments, (44) Oreg. 826.

seed identification, (44) 143.

seed trade, statistics, (42) 135.

storage, (41) Ill. 834; (48) 188, Calif. 529.

Root crops—Continued.

storage cellar, plans, (42) Mont. 86, 590.

storage experiments, (43) N.H. 36.

tests, (49) Oreg. 525.

thinning and harvesting by machinery, (49) 86.

under irrigation, (47) Mont. 130.

varieties, characteristics, (50) 237.

variety tests, (41) Nev. 227, Mich.

636; (43) Can. 735, Minn. 824;

(44) Mont. 331, 632, Oreg. 826;

(47) Mich. 129; (48) 31; (49) 232;

(50) Mont. 134.

Root—

cuttings and chimeras, (47) 525.

development and absorption, (46) 29.

development as affected by carbon dioxide, (44) 729.

development in grassland, (45) 732.

development of grain as affected by fertilizers, (46) 132.

development, relation to hardpan, (49) 30.

development, relation to lime in soil, (43) 623.

development, studies, (49) 38.

diseases in England and Wales, (49) 645.

fungus, notes, (45) 849.

growth, (48) 726.

growth as affected by excess of moisture, (41) 820.

growth as affected by mechanical properties of soil, (48) 513.

growth as affected by oxygen supply, (41) 132.

growth, effect on activity of soil organisms, (41) N.J. 28.

growth rate, effect of diminished oxygen supply, (46) 25.

growth, relation to aeration conditions in soil, (42) 728; (48) 824.

habit, experimental modification, (41) 134.

habit in the far North, (41) 634.

hairs, growth period, (49) 729.

knot, cause and control, (50) U.S.D.A. 143.

knot nematode resistant plants, (50) Ga. 553.

knot nematodes, control, (41) N.J. 50,

Fla. 548, 660, 846; (42) 243, 450;

(43) 551; (45) Fla. 357; (48) Fla. 250.

knot nematodes, factors affecting resistance, (45) Ga. 47.

knot nematodes, relation to fruit trees and grapevines, (50) 451.

maggots, control, (41) 259; (46) N.H. 350; (47) N.H. 459; (48) N.H. 151;

(49) 453.

maggots, rearing on agar jelly, (45) 858.

pressure, (45) 528.

pressure, mechanism, (46) 431.

Root—Continued.

- rot control, (43) U.S.D.A. 153.
- rot, control by breeding, (45) 542.
- rot fungus, studies, (49) Tex. 442.
- rots in soil, effect of phosphates and lime, (49) 327.
- saps, studies, (42) 334.
- systems, charting, quadrat-bisect method, (41) 327.
- systems, development under dune conditions, (42) 728.
- systems, ecology of, (41) 327.
- tips, absorbent power of, (42) 819.
- tips, absorption of minerals by, (43) 730.
- tubercles, *see* Nodule bacteria.
- Vegetables Act, (48) 789.

Roots—*see also* Plant roots.

- absorption of carbon by, (50) 628.
- absorption of ions by, (48) 726.
- anatomical modifications, (43) 732.
- artificial budding, (43) 634.
- banding and forking in, (43) 732.
- cell vacuoles in, origin, (46) 823.
- contraction, (46) 224.
- corrosive action on marble, (50) 221.
- ecological relations of, (44) 220.
- elongation, (50) 326.
- etching effect on marble, (42) 25; (43) 422.
- greening in, (45) 528.
- growing, liberation of organic matter. (46) N.Y.Cornell 323.
- metabolism, (45) 221; (46) Mo. 323.
- monocotyledonous, anomalies in, (42) 725.
- natural grafting, (41) 522.
- of crop plants, physiological activities, (48) 25.
- of fruit trees, resistance to freezing, (44) N.Y.Cornell 820.
- of various plants, ash constituents, (41) 502.
- of *Vicia faba*, resistance to electric current, (41) 725.
- penetration in hardpan soils, (48) 212.
- reactions to carbon dioxid in soil, (45) 335.
- residual effect of carbon dioxid, (45) 813.
- resting period, (43) 634; (50) Minn. 125.
- studies, (44) 820.
- terminal meristem, (47) 126.
- vitamin content, (42) 460.
- water absorption region, (43) 526.

Rope—

- bast-fiber, mechanical properties, (42) 782.
- manila, strength requirements, (41) 884.
- manila, tensile tests, (46) 490.
- wire, determining stresses, (41) 584.
- wire, tests, (42) 387.

Rosaceae important as food plants, (41) 729.

Rose—

- aphids, control, (47) Me. 160.
- aphids, control by soap, (49) N.C. 757.
- aphids, pink and green, (49) Idaho 746.
- aphids, studies, (43) Me. 159.
- apple, culture, (45) Guam 43.
- beads, making, (44) 45)
- beetle, Japanese, notes, (43) 52.
- beetle, red, notes, (44) 352.
- bengal as bacterial stain, (46) N.Y. State 431.
- black spot, notes, (44) 750.
- blotch fungus, life history, (41) 658.
- bugs, notes, (44) N.J. 349.
- bushes and potato culture, (47) Me. 159.
- canker, notes, (43) 753; (44) 750.
- chafer in Ontario, (49) 848.
- chafer, notes, (41) Conn.State 159; (47) N.Y.Cornell 848; (48) N.J. 353.
- chafer poisoning in chickens, (44) 379; (49) Conn.Storrs 56.
- crown canker, losses due to, (48) 248.
- cuttings, propagation in acidic media, (49) 835.
- diseases in Trinidad, (43) 152.
- gall wasp, varieties, (48) 256.
- graft disease, studies, (43) 753.
- leaf spot, notes, (44) 750.
- leafhopper—*see also* Empoa rosae. notes, (41) 848; (44) 653.
- leaf-tyer, notes, (41) Conn.State 159.
- mallow, insects affecting, (41) 549.
- midge, control, (47) 757.
- midge, studies, (41) U.S.D.A. 165.
- moss, origin, (46) 842.
- perfume production, (44) 45.
- powdery mildew, notes, (44) 750.
- red rust, notes, (44) 750.
- root tumors, notes, (45) 843.
- rust, notes, (46) 44.
- seeds, feeding value, (42) 369.
- slugs, popular account, (47) U.S.D.A. 59.
- stock diseases in England and Wales, (49) 645.
- thrips, notes, (47) Fla. 656.

Roselle—

- culture and uses, (45) 140.
- culture experiments, (46) Guam 733.
- insects affecting, (41) 661.
- jellying properties, (49) Hawaii 411.
- leaves, uses, (42) Guam 37.
- natural crosses of, (44) 429.

Rosellinia—

- arcuata, notes, (47) 754.
- bunodes, notes, (49) 548.
- disease, notes, (45) 843.
- necatrix, notes, (42) 150, 151.
- sp., notes, (42) 145; (44) 445; (49) 540.
- sp. on coffee, (45) 357.
- spp., notes, (47) 547.

Roses--

- annual treatise, (41) 242; (45) 348; (47) 344; (49) 743.
- attar of, making, (44) 45.
- breeding experiments, (41) 742.
- breeding, notes, (45) 348.
- Chinese, collected by Meyer, (41) 742.
- climbing, culture, (43) 838.
- Colletotrichum on, (45) 654.
- commercial culture, handbook, (42) 239.
- culture, (44) 837; (49) Alaska 435; (50) 239, 645.
- culture and variety tests, (41) N.J. 41; (42) Wash. 838.
- culture experiments for Arizona, (50) U.S.D.A. 138.
- culture for exhibition, (42) 533.
- culture from seed, (44) 45.
- culture in America, treatise, (49) 438.
- culture in home garden, treatise, (45) 441.
- culture in India, (49) 835.
- culture in muck soil, (44) 719.
- culture, treatise, (42) 444.
- decay of culture in Bulgaria, (47) 658.
- fertilizer experiments, (47) Calif. 642.
- for Mississippi, (44) 147.
- for Nebraska, list, (43) 240.
- for Yuma region, (43) U.S.D.A. 339.
- fragrance, (41) 742.
- fungus diseases, (44) 750.
- greenhouse, new pest, (45) 859.
- hardy, for Alaska, (44) Alaska 336.
- insects affecting, (47) 655.
- mildew-resistant varieties, (41) 242; (43) 247.
- night growth, (45) 348.
- pillar, new, (41) 242.
- propagation and culture, (43) 240.
- scented, (48) 640.
- strawberry rootworm on, (43) 362; (47) 855.
- treatise, (44) 45; (45) 838; (49) 438.
- Van Fleet climbing, origin, (47) 345.
- varieties and culture, treatise, (48) 41.
- variety tests, (41) 742.
- Rosewood, identity, (46) 843.
- Rosin, production, consumption, and trade, (49) U.S.D.A. 143.
- Rosin varnish, value against borers, (46) 252.
- Rostrella coffeae on pimento, (43) 151.
- Rostronitschia nervincola n.g. and n.sp., description, (46) 344.

Rotation—

- experiments, (49) Ohio 724.
- experiments in greenhouses, (49) Oreg. 532.
- fertilizer experiments, (41) N.Y.Cornell 21; (42) N.J. 812, Minn. 826; (43) Ohio 322, Ohio 726, Can. 727, Ky. 814; (44) R.I. 32, U.S.D.A. 33, U.S. D.A. 127, Minn. 321, Del. 431; (45) Ohio 119, Mo. 215, R.I. 529, Can. 815; (46) 336, Hawaii 623; (47) S.C. 23.

Rotation—Continued.

- of crops, (41) Kans. 32, Kans. 41, R.I. 135, Del. 136, N.Dak. 139, 228, R.I. 434, Mo. 644, N.Dak. 822; (42) 132, Minn. 731; (43) Md. 133, U.S. D.A. 134; (44) N.Dak. 88, Mont. 331; (45) N.Dak. 225, Mo. 517; (46) R.I. 226; (47) Miss. 216, Ark. 725, R.I. 736; (48) N.Dak. 226, Minn. 331; (49) Tex. 429, Oreg. 510, Ohio 733, Can. 734.
- of crops—
 - alfalfa in, (43) 721.
 - and cultural methods, (46) U.S. D.A. 130.
 - costs and net receipts, (45) Ohio 189.
 - effect on fertility, (49) S.Dak. 510.
 - effect on soil moisture, (43) 210.
 - effects, (45) N.Dak. 216, Ohio 492.
 - for dairy farm, (46) Ohio 394.
 - for hog farm, (43) Ohio 333.
 - for Ohio, Ohio (41) 136, 529.
 - green manures in, (42) Calif. 822.
 - in dry farming, (41) Mont. 29.
 - legumes in, (41) N.J. 19.
 - manuring experiments, (44) N. Dak. 512.
 - on bog soils, (43) 231.
 - on Palouse silt loam, (43) Idaho 227.
 - treatise, (41) 730.
 - under irrigation, (41) Nebr. 433; (42) Calif. 822; (43) Nebr. 637; (46) U.S.D.A. 724; (49) Nebr. 328, U.S.D.A. 824.
 - v. continuous culture, (48) Del. 620.
 - value, (45) Mo. 631, 809; (46) 228; (49) Iowa 723.
 - value of liming, (46) 426.
 - yields from, (47) U.S.D.A. 429.
- plats, cake and corn feeding on, (41) 826.
- with and without legumes, as affected by lime, (43) 128.
- Rothamsted Experimental Station—
 - and agricultural science, (50) 117.
 - new laboratory building, (42) 99.
 - notes, (46) 797.
 - reminiscences and anecdotes, (47) 401, 497.
 - report, (45) 698.
- Rots, basal, on garden plants, (42) 147.
- Roughages—
 - for fattening steers, comparison, (50) Can. 269.
 - for lambs, (50) Can. 271.
 - for milk production, comparison, (49) Iowa 578.
 - for pregnant ewes, (44) Ariz. 571.
 - for steers, comparison, (49) Iowa 773.
 - process for reducing fiber content, (43) 868.

Roundworms—

- control, (50) 380.
- from pigs, (48) 778.
- in chicks, cause of pneumonia, (47) Okla. 883.
- index catalogue, (45) 654.
- suckered, of poultry, control, (50) 82.

Roup—

- and canker experiments, (50) 879.
- and chicken pox vaccine, preparation, (49) Ky. 586.
- and colds in poultry, (50) West.Wash. 185.
- control, (47) 283; (50) 586, 685.
- diphtheritic, inoculation for, (49) 885.
- etiology and treatment, (49) 482.
- immunity, relation to diet, (44) Kans. 281.
- in poultry, (41) N.J. 881; (42) Wash. 571; (48) Mo. 87; (49) Okla. 586.
- serum treatment for, (46) 196.
- summary, (44) N.J. 378; (47) Mich. 186.
- vaccine for, (46) Kans. 485.

Rowen—

- for dairy cows, (41) Mass. 276.
- in the rotation, (41) R.I. 434.

Rowett Research Institute, organization, (47) 500.

Royal palm bug, notes, (47) 553.

Rubachia glomerata diseases, (45) 647.

Rubber—

- and latex from upper and lower cut, (41) 152.
- bark, abnormalities in, (47) 50.
- bark renewal, (45) 839.
- bark ring rot, notes, (50) 49.
- bark rot, prevention, (43) 658.
- black stripe, treatment, (44) 751; (46) 455.
- black thread, control, (45) 48.
- black thread, notes, (44) 445.
- breeding experiments, (49) 735.
- brown bast—
 - and canker, corrective discussion, (50) 49.
 - bark and cortex in, (49) 548.
 - cause, (43) 659.
 - cause and prevention, (49) 446.
 - control, (42) 646; (43) 552; (44) 54, 751.
 - histological studies, (49) 446.
 - notes, (41) 659; (43) 445; (45) 451, 843; (46) 746, 747; (47) 549, 846; (48) 45; (49) 45.
 - resistant strain, (44) 538.
 - resistant trees, (46) 349.
 - studies, (50) 250.
- bud grafting, (49) 143.
- canker and brown bast, corrective discussion, (50) 49.
- canker, black-stripe, notes, (41) 659.
- canker, treatment, (41) 449.
- caoutchouc and latex vessels in leaves, (50) 41.

Rubber—Continued.

- Castilla, culture and tapping, (41) 839.
- chemistry of, progress, (41) 614.
- coconut bud rot on, (43) 156.
- collar rot, studies, (41) 546.
- colloid chemistry of, (41) 310, 801.
- crêpe, mold in, prevention, (50) 452.
- crown gall, behavior, (46) 49; (48) 747.
- culture experiments, (41) 242, 745; (42) 840; (45) 645.
- culture experiments in Uganda, (43) 344.
- culture in Indo-China, papers on, (44) 149.
- disease resembling canker, (42) 542.
- diseases, (44) 49; (48) 45; (50) 250.
- diseases and pests, (47) 251, 541; (50) 42.
- diseases and pests, treatise, (47) 755.
- diseases, exhibition, (45) 147.
- diseases in Ceylon, (49) 45.
- diseases in Federated Malay States, (43) 45.
- diseases in India, (42) 741; (43) 658.
- diseases in Indo-China, (42) 354.
- diseases in Uganda, remedies, (43) 350.
- diseases, notes, (42) 741; (43) 445; (46) 844.
- experiments, experimental error in, (50) 242.
- fertilizer experiments, (41) 817; (47) 644.
- field experimentation, methods, (41) 541.
- girth and yield correlation, (41) 653.
- growth in Philippines, (42) 446.
- history and development, (48) 842.
- in French colonies, papers on, (43) 344.
- in West Africa, improvement, (43) 149.
- industries in West Africa, (42) 44.
- industry in Brazil, (43) 344.
- industry in Gold Coast, (42) 144.
- industry, scientific methods in, (41) 113.
- insects affecting, (41) 455; (44) 57; (49) 152.
- latex—
 - coagulation, (44) 149.
 - development, (44) 443.
 - effect of heavy tapping on composition, (43) 43.
 - natural coagulation in, (42) 240.
 - origin, (45) 839.
 - quality and amount, (45) 839.
 - reaction, (44) 444.
 - rings, studies, (43) 43.
 - specific gravity and rubber content, relation, (41) 542.
 - variation in rubber content, (43) 31.
 - vessel and latex, (42) 144.

Rubber—Continued.

latex—continued.
 vessel system, relation to yield, (46) 43.
 vessels, structure, (41) 150, 541.
 yield, (49) 342.
 leaf disease, description, (45) 654.
 leaf disease, new, in Java, (43) 49.
 leaf disease, notes, (41) 841; (45) 443.
 leaf disease, South American, notes, (50) 50.
 leaf fall, control, (45) 48.
 legislation in Tropics, (42) 599.
 lightning injury, (41) 245; (47) 356.
 moldy rot, notes, (42) 647; (44) 751; (45) 550; (46) 455.
 moldy rot of tapped bark, (47) 549.
 moldy rot, treatment, (50) 49, 250.
 occurrence in West American shrubs, (42) 143.
 of Dutch East Indies, variation in samples, (41) 542.
 peculiarities of individual trees, (41) 653.
 phloem necrosis, cause, (47) 549.
 Phytophthora disease, (41) 55.
 pink disease, control, (45) 752.
 plant survey of western North America, (42) 143.
 plantations in Netherlands India, (43) 748.
 plantations, thinning, (46) 737.
 plantations, thinning, bark examination in, (46) 143.
 planters, courses for training, (43) 659.
 planting methods, (44) 47.
 plants, (46) 42.
 plants of North America, (45) 336; (48) 829; (49) 29.
 plants, producing, (41) 345.
 pollination experiments, (44) 443.
 preparation, analysis of chemicals for, (46) 114.
 preparation and testing, (45) 210.
 production in East Africa, (44) 594.
 propagation, vegetative, (44) 443.
 red root disease, (42) 846.
 renewing bark as affected by preservatives, (41) 542.
 reproductive organs, (42) 541.
 research in Dutch East Indies, (42) 643.
 rôle in economic progress and international trade, (49) 94.
 root disease, notes, (42) 350; (43) 653.
 root diseases, fungi causing, (47) 548.
 rustiness in, cause, (49) 151.
 seed, germination and preservation, (41) 449, 541.
 selection, (41) 150, 653; (43) 748; (46) 223.
 soils, Malayan, (41) 319.

Rubber—Continued.

starch in, amount and movement, (45) 839.
 stone cell ring in bast, origin and growth, (49) 626.
 substitutes in Germany, (43) 204.
 synthesis, (41) 10.
 tapping experiments, (41) 151, 242, 542, 745; (42) 144, 840; (43) 43, 344, 748, 841; (44) 47; (45) 140.
 tapping, intervals, (47) 644.
 tapping methods, (43) 344; (45) 645.
 tapping methods, effect, (46) 43.
 tapping rot, remedies, (43) 658.
 tapping with driptins, (42) 144.
 thinning, (41) 150, 653.
 tires, coefficient of friction, (44) 284.
 transpiration in, (49) 626.
 trees, budded, latex vessels in scion and stock, (46) 42.
 trees, mother and daughter, correlation, (46) 737.
 trees, transplanted, latex of, (50) 647.
 trees, wound healing, (41) 449.
 trees, yield, relation to size, (47) 644.
 tubing, deterioration on boiling, (42) 564.
 wet-rot disease, (48) 850.
 wild v. plantation, (42) 44.
 yields, variation in, (41) 653.
 yields, variation in and improvement, (43) 31.
 Rubidium in Hagerstown soil, (49) Pa. 210, 617.
 Rubieva multifida, essential oil from, (43) 502.
 Rubus idaeus, seed germination, (42) 432.
 Rubus leaf spot, description, (48) 848.
 Rudbeckia, inheritance of special traits, (49) 24.
 Rumen, atony of, (43) 780.
 Rumen feed, composition and digestibility, (43) 267.
 Rumex stomata, physiology of, (48) 828.
 Ruminants—
 acute indigestion in, (45) 381.
 parasites of, (46) La. 281.
 stomach and intestinal ailments, (45) 73.
 Run-off—
 and evaporation formulas, (48) 285.
 and rainfall studies, (46) 380.
 as affected by cropping and cultivation, (41) 622; (43) Mo. 721.
 as affected by forests, (47) 210.
 coefficient in France, (42) 887.
 determination, (42) 82.
 from catchment areas, (47) 488.
 from muck soils, determination, (45) 339.
 from underdrained land, (45) 80.
 in Miami Valley, (45) 586.
 inspection and costs, (42) 887.
 investigations on Third Creek, (41) N.C. 686.

Run-off—Continued.

maximum, determination, (46) 778.
on a Florida drainage area, (41) 686.
on forested and unforested soils, (44) 418.

storm water, estimating, (42) 479.
studies, (46) Mo. 315.

Rural—*see also* Community and Country.

child labor, (47) 193.

child welfare, papers on, (50) 194.

children, handicaps of, (48) 599.

church—

and agricultural problems, (48) 190.

and rural life, (45) 492.

community service, (45) 897.

field of Americanization for, (48) 493.

in colonial counties, treatise, (48) 494.

in industrial zones, (48) 892.

in reconstruction, (41) 387.

life in South, (50) 494.

problems in Texas, (41) 591.

social service, (42) 191.

survey, homesteader and his church, (49) 893.

survey of Sedgwick County, Kansas, (49) 893.

survey, questionnaire for, (42) 690.

survey, Town and Country Series, (48) 493, 494, 892; (49) 94, 893; (50) 494, 794.

war's challenge to, (44) 791.

communities—

child caring work in, (41) 890.

child welfare teaching, (43) 694.

list of publications, (43) 595.

nursing and social service needs, (41) 890.

regulations in Ontario, (44) 192.

treatise, (43) 894.

community—

activities, treatise, (49) 391.

buildings, organization, (45) U.S. D.A. 394.

buildings, plans, (44) U.S.D.A. 888.

buildings, studies, (42) U.S.D.A. 489.

buildings, uses, (47) U.S.D.A. 896.

center movement in Canada, (41) 495.

Conference, Cornell Farmers' Week, (44) 791.

definition, (49) 391.

description and mapping, (46) 596.

development, (48) 493.

education, papers on, (50) 893.

evolution of, treatise, (49) 391.

fair, (42) Wis. 490.

historical pageant in, (48) 897.

history exhibit, (47) 897.

Rural—Continued.

community—continued.

organization, (47) 797; (49) 192, 893; (50) Mont. 893.

organization, fundamentals, (46) 895; (48) 96.

organizations, debates, plays, and music for, (47) 897.

plays, (44) 192.

progress in Kansas, (46) 496.

recreation, (45) 593.

social responsibilities, (44) 791.

treatise, (47) 192.

with highest score, (46) W.Va. 191.

conditions affecting maternity and infant care, (41) 794.

cottages of various types, (44) 689.

cottages, remodeling in England, (44) 689.

credit, *see* Agricultural credit.

depopulation and absenteeism in Spain, (41) 890.

development, methods and policies, (43) 894.

development, papers on, (48) Calif. 187.

districts, high schools in, (42) Wis. 394.

districts, repopulating, in France, (42) 391.

economics—

definition of subject matter, (42) 789.

experiment station research in, (50) 101.

historical survey, (48) 686.

in Argentina, (46) 495.

in Bohemia, (47) 695.

in Europe, (49) 596.

in India, (43) 292.

in Japan, (50) 892.

investigations in, (49) Wis. 690.

papers on, (48) U.S.D.A. 890.

principles of, (41) 92.

problems in Argentina, (45) 893.

research aspects, (41) 701.

studies, (44) Calif. 787; (47) 92.

teaching, (46) 497.

textbook, (42) 789.

treatise, (45) 691; (47) 593; (50) 891.

value, (46) 192.

economy of France, (41) 490.

education—

aims, (48) 96.

as a profession, (46) 93.

in Oxfordshire, England, (50) 93.

in Wales, (44) 596.

papers on, (48) 895.

survey, (49) 793; (50) 194.

treatise, (59) 494.

electrical system in Kansas, (42) 591.

Europe, making of, treatise, (49) 191.

government, improvement, (50) 92.

health, (46) 89.

Rural—Continued.

- health, war's challenge to, (44) 791.
- homes relation to boys' and girls' clubs, (46) 598.
- housing cooperative societies for India, (49) 191.
- housing, important factors, (42) 86.
- income tax in New Zealand, (42) 291.
- industries—
 - and wages in New South Wales, (46) 494.
 - around Oxford, (46) 788.
 - in Great Britain, (41) 490; (49) 694.
 - possibilities of increased production, (42) 688.
 - studies, (48) 391.
 - treatises, (41) 506, 592.
- institutions, activities, and results, (47) Calif. 694.
- juvenile court, problems, (43) 294.
- labor, *see* Agricultural labor.
- leaders, professional training, (50) 394.
- leadership, register, (41) 897; (45) 295.
- life—
 - and agriculture in California, treatise, (48) 893.
 - and agriculture in Michigan, treatise, (48) 391.
 - and Christianity, outline, (44) 192.
 - and community civics, (47) 598.
 - and education, treatise, (48) 496; (49) 296.
 - Conference, proceedings, (47) 394.
 - effect of power and machinery on, (47) 597.
 - factors affecting agricultural development, (42) 303.
 - improving conditions, (49) 192.
 - in Cotton Belt, (46) 189.
 - in Denmark, (49) 897.
 - in England, organization, (43) 487.
 - in France, papers on, (43) 292.
 - in India, (43) 293.
 - in the Haute Marne, (41) 591.
 - social aspects of, (50) Iowa 892.
 - studies, list of topics, (41) U.S. D.A. 292.
 - studies, research projects, (43) 595.
 - survey, report, (48) 192.
- literary and debating society, (48) 190.
- living costs in Great Britain, (41) 193.
- motor routes, (41) U.S.D.A. 383.
- motor truck routes for marketing products, (42) U.S.D.A. 289.
- neighborhood as social unit, (50) N.Y.Cornell 492.
- New York, juvenile delinquency in, (44) 791.
- New York, treatise, (45) 291.
- organization, papers on, (46) 89.

Rural—Continued.

- organization, primary groups, (48) N.C. 95.
- pavements, types, (44) U.S.D.A. 884.
- planning, social aspects, (49) U.S.D.A. 694.
- population—*see also* Population.
 - cityward migration, (45) 395.
 - cityward movement, benefits, (47) 394.
 - education of, (49) 95.
 - of Belgium, social conditions, (48) 690.
 - of United States, (41) U.S.D.A. 890.
 - psychology of, (47) 896.
 - sociology of, (48) U.S.D.A. 890.
 - studies to be conducted, (49) 492.
- press as educational agency, (48) 792.
- primary groups, (46) Wis. 894.
- primary groups of Otsego Co., (50) N.Y.Cornell 492.
- problems, activities for interracial committees, (47) 896.
- problems in Ireland, leadership, (49) 192.
- problems in United States, (41) 590, 591; (45) 394.
- property, valuation, (46) 593.
- reading matter, (47) Nebr. 798.
- reconstruction in Ireland, (47) 94.
- reconstruction, treatise, (46) 596.
- refrigerating plants, (45) 591.
- religious forces, relation to agriculture, (42) 191.
- sanitation, (46) 782.
- sanitation in England, (42) 594.
- sanitation, popular account, (42) 591; (44) 87, 88.
- sanitation, report, (42) 86.
- schools, *see* Schools, rural.
- science, textbook, (43) 195.
- service, training for, (43) 495; (46) 895.
- situation in South, needs, (44) 892.
- social agencies in Ohio, (49) 192.
- social life and recreation, (44) 892.
- social organization, treatise, (45) 592.
- social survey, history and methods, (42) 690.
- social survey of Lone Tree Township, (44) Iowa 292.
- socialization, (43) 91.
- sociology, lectures on, (42) 796.
- sociology, readings in, (44) 791.
- sociology, research aspects, (41) 701.
- sociology, treatise, (47) 896; (48) 189.
- sociology, value, (50) 394.
- structures of reinforced concrete, (42) 187.
- surveys, technical guide, (41) 292.
- teachers in Pennsylvania, status, (48) 295.
- teachers, preparation, (45) 898.
- teachers, training, (48) 895.

Rural—Continued.

- training laboratory, (48) Mo. 686.
- v. city health, (46) 294.
- v. urban drafted men, defects in, (41) 794; (44) 490.
- welfare work of Mexico, (50) 694.
- Rush stem disease in Japan, (50) 248.
- Rushes, analyses, (41) Wyo. 333.
- Russia, world's need of, (49) 491.
- Russian knapweed, new, (47) Kans. 830.
- Russian thistle, *see* Thistle.
- Rust—

- fungi, culture studies, (45) 144.
- fungi, distribution in Baltic regions, (46) 239.
- mite, control, (44) 858.
- mite, effect of freeze of 1917, (43) 555.
- mites, sulphur compounds for, (46) 355.
- resistance, genetics of, (44) 50.
- resistance, inheritance, (45) N.Dak. 245.
- spores, temperature of germination, (43) N.H. 842.
- Rusts—*see also specific host plants.*
- American, culture experiments, (48) 844.
- effect on photosynthesis, (44) 518.
- new or rare species, (47) 839.
- North American, on *Cyperus* and *Eleocharis*, (42) 448.
- of Delaware, list, (43) 328.
- of Douglas Lake region, Michigan, (41) 842.
- of Swiss coniferous trees, (42) 50.
- polemoniaceous, (42) 448; (46) 344.
- studies, (41) 152, 245, Mo. 654; (43) Iowa 654; (49) Ind. 537.
- unusual, notes, (48) 845.

Rusty leaf mite, control, (44) Oreg. 850.

Rutabagas, *see* Swedes.

- Rutgers College, notes, (41) 498, 899; (42) 300; (43) 199, 799; (44) 299; (45) 300, 699; (46) 197, 396, 795; (47) 197; (48) 194, 397, 697; (49) 99, 197, 698; (50) 698.

Rye—

- analyses and use as feeding stuffs, (45) 373.
- and vetch as fall forage, (43) Mo. 736.
- and wheat hybrid, fertile, (41) 645.
- and wheat hybrids, production, (44) 736; (48) 334.
- and wheat, natural hybridization in Russia, (48) 735.
- as affected by aluminum, (41) 214.
- as affected by ammonium sulphate, (47) Mass. 218.
- as affected by phos-pho-germ, (45) 817.
- as affected by potash, (49) 817.
- as affected by sodium arsenite, (41) 625.
- as affected by sodium chlorid, (45) 586; (48) Calif. 515, Calif. 524.
- as green manure, (41) Del. 136; (42) Va. 427; (43) U.S.D.A. 134.

Rye—Continued.

- as hay crop, (44) Alaska 328, Alaska 329; (47) Calif. 631.
- as nurse crop, (47) Ohio 137.
- as wheat substitute, (44) U.S.D.A. 761.
- bran, analyses, (42) Tex. 769; (43) N.J. 69, N.J. 672; (45) N.J. 775; (47) N.J. 571.
- bran, effect of flour extraction, (44) 867.
- bran, energy value, (47) 69.
- breeding and inheritance experiments, (48) 531.
- breeding experiments, (41) Alaska 31, N.C. 638; (44) Alaska 327, Alaska 329, Alaska 521; (48) Mich. 224, S.C. 629; (49) 329; (50) 28.
- broken stem disease, description, (42) Ohio 644.
- certification in Germany, (50) 439.
- climatic requirements, (41) U.S.D.A. 417.
- composition as affected by soils and fertilizers, (41) 422.
- cost of production, (42) Mo. 188.
- cost of production in Westphalia, (47) 93.
- culture, (45) Wis. 131, 630~
- culture experiments, (41) 228, 229, Can. 528, 639; (42) 132, N.Dak. 732; (43) Ariz. 733; (45) N.Dak. 225; (47) U.S.D.A. 330; (48) N.Dak. 225, 434, Can. 450; (50) U.S.D.A. 132, Can. 231.
- culture in the West, (50) U.S.D.A. 639.
- culture in United States, (41) U.S.D.A. 643.
- culture on peat soil, (43) 23.
- decomposition rate in soil, (46) N.Y. Cornell 212.
- dietetic value, (47) 668.
- digestibility coefficients, (48) 574.
- disease-resistant varieties, (45) N.Dak. 225.
- diseases, (45) 444.
- diseases, control, (43) Tex. 845.
- dockage removal at the thresher, (47) 91.
- double germination of, (45) 532.
- effect of injury, (46) 232; (48) 134.
- effect on following crop, (41) R.I. 135.
- ergot, control, (45) Wis. 131; (46) 546.
- ergot, loss from, (47) 245.
- ergot, notes, (44) 48, Wis. 241.
- ergot on Manitoba wheat, (46) 240.
- ergot, removal by brine baths, (42) Wis. 350.
- ergot, studies, (46) 322.
- fall planting, (43) Wash. 738.
- fall v. spring planting, (42) Mich. 635.
- feed, analyses, (41) Conn.State 176; (42) Mich. 63, 560, Mass. 866; (43) R.I. 672; (47) N.J. 571.
- feed, composition and retail price, (47) Conn.State 570.

Rye—Continued.

- feeding value, (50) Can. 370.
 fertilizer experiments, (41) R.I. 135, 229; (42) 329, 719, Minn. 826; (43) 126; (44) 421, 815; (47) 321, 726; (50) 235, 423.
 flag smut, control, (49) 646.
 flour, analyses, (42) Tex. 769.
 flour, milling grade, (41) 313.
 foot and root rot, differences in susceptibility, (47) Minn. 347.
 for fattening pigs, preparing, (44) Del. 366.
 for silage, (41) Mo. 334, 732.
 fresh, effect of storage conditions, (45) 437.
 from Volga region, composition, (50) 169.
 frost injury, (41) 335.
 fungi affecting, (44) Minn. 745.
 Fusarium blight, notes, (44) 243.
 Fusarium disease, studies, (50) 245.
 germination as affected by fertilizers, (44) Va. 721.
 germination, effect of soil acidity, (47) 722.
 Göttinger, breeding, (48) 337.
 grades, (48) U.S.D.A. 230.
 green manuring experiments, (41) N.J. 19; (44) 321; (46) 514; (48) N.Dak. 226, 324.
 growth in alkali soil, early, (42) Utah 28.
 growth in artificial light, (48) 26.
 harvesting in Argentina, (47) 32.
 hay, feeding value, Calif. (44) 776; (47) 673.
 hay, nutritive value, (47) Calif. 668.
 Helminthosporium disease, Minn. (44) 244, 745.
 hogging down, (41) Ohio 569.
 hogging down, costs and returns, (49) Ohio 372.
 hybridization, technique, (45) 737.
 hybrids, shifting of gamete frequency in, (47) 230.
 improvement, (46) 839; (49) N.C. 733.
 inheritance of albinism, (43) 132.
 jointworm, control, (42) U.S.D.A. 753.
 leaf rust resistance, (50) 129, 648.
 leaf rust, studies, (43) Ind. 345.
 liming experiments, (42) 523.
 limits of toxicity of ammonium sulphate for, (42) 219.
 lodging in, (41) 636.
 manure utilization, as affected by time of liming, (44) 215.
 middlings, analyses, (41) Conn.State 176, Ind. 564, Ind. 868; (42) 263, Ind. 769, N.H. 769, Tex. 769; (43) Ind. 69, N.J. 69, Ky. 373, N.J. 672, 867, Ind. 867; (44) Mass. 671; (45) N.J. 775, 872; (46) Can. 168, N.H. 675; (47) Mass. 274, 275, N.J. 571, R.I. 571; (48) 68.

Rye—Continued.

- middlings, composition and retail prices, Conn.State (44) 176; (45) 375.
 mixed feed, analyses, (43) Ky. 373; (45) 872.
 new insect pest, (41) 661.
 nitrogen application, time of, (44) Calif. 724.
 origin and early habitat, (44) 735.
 physiological characters, (42) 128.
 planting dates, (42) Minn. 826.
 plat tests, technique, (41) 432.
 production, consumption, and trade, (41) 826, U.S.D.A. 891.
 production in United States, (49) U.S.D.A. 389.
 production in Yugoslavia, (48) U.S.D.A. 529.
 products, analyses, (47) N.Y.State 172.
 protein content, factors affecting, (48) 529.
 protein, nutritive value, (42) 755.
 quality, effect of soil conditions, (49) Mich. 449.
 red dog, analyses, (42) Ind. 769; (43) 867.
 response to fertilizers, (48) R.I. 518.
 Rosen, improvement, (45) Mich. 899.
 Rosen, origin, (45) Mich. 635.
 rotation experiments, (42) 132; (45) R.I. 529, 735; (46) 819.
 sawfly, black grain-stem, (43) U.S.D.A. 363.
 scab organism, production of conidia, (43) 545.
 screenings, analyses, (41) Ind. 564.
 seed, as affected by heat, (41) 430.
 seed, drying, (41) 730.
 seed improvement, (47) N.C. 528.
 seed, standards, (47) 39.
 seed treatment with dry heat, (42) 644.
 seedling experiments, (41) Ariz. 332; (44) Minn. 331, Minn. 732, Oreg. 826; (47) Minn. 331; (48) Minn. 331, Minn. 332; (49) Can. 734; (50) Minn. 132, 235.
 seedling blight, cause, (50) 648.
 self- and cross-fertilization, (42) 735.
 self-fertilization, (48) Mich. 337.
 smut, control, (45) 49.
 smut, notes, (43) 445.
 smut, western, control, (48) Can. 450.
 starch, microphotograph of, (48) 708.
 State standards, (44) Mont. 143.
 stem rust, injury from, (49) 840.
 straw, digestibility, (43) 569.
 straw, hydrolyzed, digestion coefficients, (43) 267.
 straw, hydrolyzed, feeding value, (47) 274; (48) 265.
 straw in the rotation, (41) R.I. 434.
 straw worm, control, (42) U.S.D.A. 752.

Rye—Continued.

- systematic account, (46) 322.
- time of planting, (44) Mich. 195.
- toxic limit of alkali for, (49) 513.
- treatment, (46) 449.
- v. barley for pigs, (45) Mich. 875.
- varieties, (43) N.C. 434; (44) Wis. 226; (46) Mich. 633; (47) Alaska 527; (49) Ga. 524.

varieties—

- characteristics, (50) 237.
- for Canada, (47) 823.
- for seed in Poland, (50) 439.
- new, description, (46) 531.
- response to nitrogenous fertilizers, (50) 232.
- yields, (45) Wis. 132.

- variety tests, (41) Alaska 31, Idaho 225, 638, N.C. 638; (42) 132, U.S.D.A. 336, 530, Minn. 731, N.Dak. 732, Minn. 824, Minn. 826; (43) Okla. 32, 231, 232, N.Dak. 332, 528, Can. 735, Minn. 823; (44) Alaska 329, Minn. 330, Alaska 521, Alaska 523, Ariz. 524, N.Dak. 524, Minn. 732, Va. 732; (45) N.Dak. 225, Wis. 227, Okla. 430, Can. 822, 828; (46) 131, 531; (47) Minn. 332, Minn. 333, Alaska 527, Ark. 732, 824, Okla. 824; (48) N.Dak. 30, Ga.Coastal Plain 128, Minn. 331, Minn. 332, Ga.Coastal Plain 628, 730; (49) 232, Okla. 428, R.I. 526, Idaho 732, Can. 734; (50) Minn. 133, West.Wash. 134, 136.

weed control methods, (41) 737.

wheat nematode attacking, (43) 751.

white-ear, cause, (49) 455.

winter—

as affected by excessive amounts of fertilizer, (48) 520.

as pasture crop, (47) Ark. 776.

blooming and harvest time in Germany, (49) 736.

blossoming and fertilization, (42) 734.

culture, N.Dak. (48) 29; (50) 34.

culture experiments, (43) Mont. 332.

culture in Saskatchewan, (47) 823.

resistance, (50) 231.

seeding experiments, Minn. (43) 823; (48) 332.

time of planting, (47) Minn. 332.

variety tests, (49) Alaska 426.

world's production and consumption, (42) 439.

yield cycles, (41) 892.

yields, (41) N.J. 35; (44) Wash. 225; (47) Minn. 129, Wash.Col. 528.

yields in Australia, (43) 528; (46) 132.

yields in New Jersey, (46) 225.

Ryegrass—

as affected by sodium carbonate, (45) 116.

breeding experiments, (46) 633.

Ryegrass—Continued.

culture experiments, (41) Idaho 225.

culture in British Columbia, (42) 733.

English, duration in meadows, (50) N.Y.Cornell 231.

Italian, culture experiments, (43) Wash. 426.

Italian, description, (42) U.S.D.A. 340.

Italian, fertilizer experiments, (41) 228, 815.

Macoun, analyses, (41) Wyo. 333.

perennial, cultivation and utilization, (42) U.S.D.A. 233.

perennial, seed tests, (48) 36.

smut, (45) Can. 842.

smut, life history and control, (45) 546.

sod, western, breaking for winter wheat, (49) Can. 734.

western, breeding experiments, Can. (48) 31; (50) 433.

western, culture experiments, (48) Can. 450.

western, toxic limit of alkali for, (49) 513.

western, variety tests, (49) Can. 734.

"Wimmera," (41) 641.

yields, (42) Minn. 826.

Rynchospora nigra, eye of, notes, (42) 355.

S. M. A. (Synthetic milk adapted), for infant feeding, (42) 660.

Sabethini, American, revision of, (42) 652.

Sabovich, H. L., biography, (47) 495.

Saccharids in plant tissues, effect of temperature, (50) 21.

Saccharimeter, new British, (48) 612.

Saccharimeters, standardizing, (41) 799.

Saccharimeters, testing, (44) 13.

Saccharin—

analysis, (41) 115; (44) 806.

detection, (44) 806.

determination in urine, (42) 316.

determination, methods, (42) 613.

effect on catalase of blood, (44) 462.

in food, effects, (44) N.Dak. 360.

in foods, determination, (43) 115.

manufacture and uses, (45) 62.

products, analysis, official method, (44) 9.

tablets, chemical changes in, (43) 12.

use, (43) N.Dak. 368.

Saccharomyces cerevisiae—

food requirements, (45) 465.

growth in synthetic medium, (50) 362.

notes, (47) U.S.D.A. 114.

utilization of atmospheric nitrogen by, (49) 819.

Saccharomyces musae in banana must, (41) 716.

Saccharomycetes, studies, (50) 426.

Saccharose—

detection and identification, (47) 205.

solution, effect on bud growth of cuttings, (49) 834.

Saccharum species and hybrids, cytological study, (49) 822.

Saccharum spontaneum as paper-making material, (41) 732.

Saddled prominent on beech and maple, (42) 647.

Safflower oil, uses, (46) 502.

Safflower seed, germination, (50) 427.

Saffron, culture in Macedonia, (43) 746.

Sage—

California, new aphid on, (48) 53.

poisonous to livestock, (47) Nev. 786.

Sagebrush, climax formations, (41) 634.

Sainfoin—

characteristics and uses, (48) 435.

clover sickness, notes, (46) 741.

culture experiments, (45) Kans. 33.

seed, hulled and unhulled, (49) 230.

winter habit, (50) 333.

Saissetia nigra, notes, (42) 546; (47) 254.

Saissetia oleae, *see* Black scale.

Sal—

as affected by badly aerated soils, (43) 448.

Bengal, growth rate, (47) 42.

disease, studies, (41) 543.

forests, regeneration, (45) 540.

insects affecting, (41) 57; (42) 357.

natural reproduction, (43) 543.

root rot inoculations, (43) 652.

root rot, notes, (44) 445; (45) 48.

seedlings, dying back, note, (44) 545.

seedlings, growth of, (43) 543.

strength and seasoning properties, (42) 643.

Salad dressings, analysis, (47) 312.

Salad plants, culture on seashores, (43) 523.

Salads, substitutes in Germany, (43) 204.

Salai, tapping experiments, (44) 538.

Salep, mannan of, utilization, (43) 366.

Salicylates, determination, (45) 806.

Salicylic acid, determination, (41) 804.

Salicylic acid, effect on molds, (45) 463.

Saliva—

amylolytic power, determining, (41) 115.

chemical constituents, (50) 161.

effect on bacterial content of stomach, (46) 862.

human, effect of stimuli, (48) 755.

human mixed, studies, (48) 462.

of pellagrins, studies, (41) 469.

reaction and effect on teeth, (47) 367.

Salivary secretion in infants, (47) 766.

Salix—*see also* Willows.

babylonica in Australia, (49) 837.

hybridization experiments, (48) 729.

pentandra, use as fiber plants, (44) 435.

Salmon—

bacterial decomposition, (44) 62, 556; (46) 753.

canned, bacteriology, (41) 557.

Pacific Coast, spoilage in, (49) 802.

Salmonberry-raspberry hybrid, (44) Alaska 336.

Salpingitis in cows, (45) 788.

Salt—

as hawkweed eradicator, (42) 439.

balance for plants, (44) N.J. 324.

balance of plants, effect of soil moisture, (42) 626; (46) N.J. 525.

consumption by cattle, (49) Kans. 466.

content of soil, effect, (47) 19, 515, 721.

detection in feeds, (45) Tex. 14.

detection in stock feeds, (48) 712.

determination in oleomargarin and butter, (48) 712.

effect on *Bacillus botulinus*, (44) 559.

effect on molds, (45) 463.

effect on *Sterigmatocystis nigra*, (50) 22.

effect on sugar beets, (46) 719.

effect on trichinae, (44) U.S.D.A. 80.

effects in bacterial growth, (48) 432, 828.

fertilizing value, (41) Me. 143; (45) 818.

grades for cattle, (45) 874.

immunizing action against anaphylactic injection, (41) 476.

impurities, effects on fish salting, (43) 663.

in poison bait for grasshoppers, (43) 354.

in water, effect on rice, (44) La. 38.

ingestion effect on chlorin content of blood, (46) 174.

lands, formation in India, (44) 509.

metabolism as affected by high altitudes, (43) 566.

mixed, fertilizing value, (50) U.S.D.A. 621.

pan in South Africa, (48) 519.

penetration in fish, (46) 664.

petrography in potash mining, (44) 322.

proportions for young cotton, (46) 629.

requirements of livestock, (49) Wis. 167.

requirements of plants, (45) 334.

requirements of plants, plan for research on, (44) 130.

requirements of potatoes, (46) N.J. 526.

requirements of seed plants, (46) 26.

rock, effect on live stumps, (43) 281.

rock, effect on plants, (46) 732.

solutions, H-ion concentration, for intravenous medication, (47) 203.

teaspoonful, weight, (48) 159.

use against barberry, (49) U.S.D.A. 146.

use against grasshoppers, (45) 151.

use with calcium cyanamid, (41) 723.

value in corn silage, (44) Mich. 175.

Saltbush—

Australian, culture and use, (41) U.S. D.A. 827.

poisonous to livestock, (47) Nev. 786.

Salton Sea water, analyses, (44) Ariz. 513.

Saltpeter, *see* Potassium nitrate and Sodium nitrate.

Salts—

- alkali, toxicity and antagonism in soil, (49) 620.
 - antagonistic, effects on respiration of organisms, (43) 820.
 - antiseptic and bactericidal action, (45) 75.
 - availability, effect of soil colloids, (48) 214.
 - crude mixed, potash content, (43) 26.
 - distribution in milk, (49) 205.
 - double, equilibrium concentration, (43) 25.
 - effect on azofication in soil, (47) 516.
 - effect on bacterial growth, (47) 524, 723; (49) 321.
 - effect on catalase production, (44) 63.
 - effect on reaction and buffer system of plants, (50) Calif. 221.
 - effect on soils, (45) 21.
 - effect on viscosity of flour-in-water suspensions, (50) 504.
 - excess soluble, in greenhouse soils, (49) Ind. 636.
 - from evaporation of soil extract, (43) 625.
 - in diet, effect on reaction to infection with tubercle bacillus, (49) 859.
 - in human nutrition, discussion, (49) 762.
 - in milk, effect on alcohol test, (49) 716.
 - in soil, effect on plants, (47) Calif. 620, 812.
 - in soil, toxicity in relation to osmotic pressure, (46) 209.
 - inorganic, effect on wood hydrolysis, (48) 713.
 - inorganic, microscopic identification, (48) U.S.D.A. 204.
 - intake and translocation by plants, (44) 425.
 - marine, fertilizing value, (41) 724.
 - neutral, decomposition by humus, (50) 514.
 - neutral, in contact with colloids, splitting, (41) 364.
 - plant injury and recovery from, (46) 128.
 - rate of absorption by plants, (44) 425.
 - soluble, effect on soil, (42) Calif. 811.
 - soluble, variation in soils, (46) 623.
- Salvarsan**, disinfecting power, (43) 79.
- Salvia—**
- growth and composition as affected by length of day, (49) 739.
 - leaf miner and parasites, (50) 661.
- Sambucus canadensis**, seed germination, (42) 432.
- Sambucus racemosa**, oil from, (42) 410.
- Samia cecropia**, *see* Cecropia moth.
- Sampling horn**, new type, (47) 804.

San Antonio Experiment Farm, (47) U.S.D.A. 496.

San José scale—

- control, (42) 153; (43) Ohio 356; (44) Tex. 756, Mo. 856; (45) 755; (46) 350; (47) Wash.Col. 550, 759; (48) Mo. 650; (49) Wash.Col. 251, Mo. 253, U.S.D.A. 354, 355, 452; (50) Conn.State 50, Mo. 51, 153, 453, N.Y.State 555, 844.
 - control, failures in, (46) Ill. 855.
 - in South Dakota, (41) 59.
 - new treatment, (47) U.S.D.A. 453.
 - notes, (43) Mo. 758.
 - spraying experiments, (41) 54, Mo. 356; (42) Ill. 358; (45) Idaho 251; (46) Ark. 658.
 - summary, (49) 153.
 - tolerance to sprays, (49) Wash.Col. 452.
 - winterkilling, (44) 654; (45) Wash. 252.
- Sanbornia juniperi** n.g. and n.sp., (43) U.S.D.A. 758.
- Sand—**
- and clay, apparatus for separating, (50) 14.
 - and gravel production, survey, (45) U.S.D.A. 290.
 - blow planting, (49) Mich. 439.
 - capillary ascent of liquids in, (48) 18.
 - covering for peat bogs, (43) 23.
 - dunes, ash of plants from, (43) 431.
 - dunes, forestation methods, (43) 651.
 - dunes, reclamation, (41) 343.
 - dunes, vegetation, (41) 633.
 - effect on reaction of nutrient solutions, (43) 210.
 - excess, in concrete mixtures, use, (46) 487.
 - filters, adsorption in, (46) 892.
 - flies, bionomics, (47) 853.
 - graded, test for organic impurities in, (48) 286.
 - hills, forests in, (44) 46.
 - hills of Kansas, studies, (43) 731.
 - horizontal pressure, (43) 889.
 - measurements in making concrete, (49) 285.
 - shifting, stopped with oil, (44) U.S. D.A. 189.
 - tolerance in aggregates, (46) U.S.D.A. 187.
 - variations in, effect on fertilizer experiments, (47) 814.
 - wet, angle of repose, (43) 122.
- Sandal—**
- diseases, notes, (41) 522.
 - spike disease, cause, (44) 545, 546.
 - spike disease, notes, (42) 46, 544; (43) 448; (44) 156, 157, 342; (48) 740.
- Sandalus niger**, larvae, (45) 361.
- Sandstone**, black, ulmite from, (48) 617.
- Sandstone**, obolus, fertilizing value, (44) 421.

- Sandwiches, energy content, (45) 861.
- Sandy hill land, development experiments, (41) 813.
- Sandy soils—
- absorption of sodium carbonate and sodium chlorid by, (43) 516.
 - and heavy, as affected by borax, (49) U.S.D.A. 325.
 - effect of clay addition to, (45) 418.
 - evaporation, studies, (44) 210.
 - fall v. spring plowing, (44) N.Dak. 125.
 - how to farm them, (41) Wis. 18.
 - improvement, rotation experiments, (42) Wis. 323.
 - in South Australia, improvement, (43) 721.
 - loam, fertilizer experiments, (43) N.C. 424.
 - management, (50) Minn. 120.
 - management under irrigation, (45) Oreg. 485.
 - reclamation, (42) 813.
 - studies, (50) Mich. 419.
 - treatment, (48) 616.
 - water-holding capacity, (47) Wis. 416.
- Sanitation—
- and drainage, treatise, (47) 392.
 - rural, *see* Rural sanitation.
 - tropical, (42) 599.
- Sanninoidea—
- exitiosa, *see* Peach borer.
 - opalescens, control, (47) 855; (50) Oreg. 53.
 - opalescens, notes, (44) Oreg. 850; (46) 749.
- Santonin, ascaricidal value, (44) 185; (45) Okla. 478; (50) 380.
- Santuzza kuwanii n.g. and n.sp., description, (42) 751.
- Sap ascent, physiology of, treatise, (49) 820.
- Sap density of trees, studies, (49) 536.
- Sap stain fungi, notes, (48) 649.
- Sap stains in green wood, control, (47) U.S.D.A. 755.
- Sapang, culture directions, (45) 35.
- Saperda—
- calcarata, *see* Poplar borer.
 - candida, *see* Apple tree borer, round-headed.
 - carcharies, studies, (45) 361.
 - concolor, notes, (41) Conn.State 159.
 - cretata, studies, (44) U.S.D.A. 165.
 - populnea, oviposition and parasites, (42) 362.
- Sapodilla tree, tumors on, (46) 150.
- Saponification—
- effect of ester transposition, (42) 502.
 - number, determination, (42) 111.
- Saponin—
- effect on plant cells, (48) 126.
 - effect on respiration, (48) 124.
 - hemolyzing power, (42) 310.
 - in extracted beet pulp, (45) 204.
- Saponin—Continued.
- physiological rôle, (47) 425.
 - value in lime-sulphur wash, (43) 346.
- Saponins, effect on surface tension of water and hemolytic power, (44) 679.
- Sapote, culture, (44) Ariz. 532.
- Sapotes, analyses, (47) Calif. 660.
- Sarache edulis, notes, (45) 353.
- Sarcobatus vermiculatus, notes, (50) U.S. D.A. 77.
- Sarcocystis—
- of bovine, hosts of, (47) 554.
 - richardi n.sp., description, (48) 151.
 - tenella, life cycle, (45) Wyo. 478.
 - tenella, morphology and development, (49) 682.
 - tenella, studies, (41) Wyo. 379; (43) Wyo. 786; (44) 184.
- Sarcoma, heterolysins in, (41) 874.
- Sarcophaga—
- aurifrons, parasite on, (42) 551.
 - carnaria, Empusa disease in, (42) 361.
 - carnaria, overwintering, (48) 157.
 - eleodis, notes, (49) Nebr. 659.
 - kellyi, parasitism by, (46) 458.
 - larval characters in, (50) 358.
 - spp., parasites of white grubs, (42) 550.
 - sternodontis, notes, (44) 549.
- Sarcopsylla gallinacca, studies, Okla. (42) 252; (43) 587.
- Sarcoptes equi, morphology, (49) 381.
- Sarcoptes scabiei suis, notes, (43) U.S.D.A. 688.
- Sarcosporidia—
- as cause of scrapie, (41) 580.
 - in muscles of sheep and horse, (44) 79.
 - relation to lamziekte, (44) 79.
- Sardines—
- bacteriology, (43) 111; (45) 364.
 - California, chemical study, (46) 466.
 - canning, (44) U.S.D.A. 556.
 - energy content, (42) 660.
 - packing and processing, (47) 262.
- Sarracenia spp. pitchers, acidity, (49) 520.
- Sarraceniaceae, absorption of nutrients by, (42) 629.
- Sarson cake, fertilizing value, (41) 816.
- Satin moth—
- occurrence in Canada, (44) 250, 252.
 - parasite of, (47) U.S.D.A. 58.
 - studies, U.S.D.A. (45) 153; (48) 52.
- Satiné, identity, (46) 843.
- Satinwood, toxic properties, (47) 443.
- Satsuma, culture experiments, (49) Tex. 436.
- Satsumanges, citrus hybrids, (44) 44.
- Sauce, Chinese fish, preparation, (44) 859.
- Sauce, Indo-Chinese fish, condensed, (43) 458.
- Sauces, European and Indo-Chinese, (41) 66.
- Sauerkraut—
- bacteriology, (46) 502.

Sauerkraut—Continued.

chemical composition, factors affecting, (46) 502.

manufacture, (41) 807; (44) U.S.D.A. 557; (47) 112; (48) 712; (50) West.Wash. 113.

pink, production by yeasts, (47) 113.
production controlled by heat, (43) 616.

Sauropatis chloris, revision of subspecies, (42) 847.

Sausage—

curing and smoking, effect on trichinae, (44) U.S.D.A. 80.

fish, descriptions and analyses, (42) 552.

substitutes, composition, (42) 552.

Sausages, examination, (41) 713, 714; (45) 13.

Sausages, ripening, (41) 467.

Savage Sudan, wild tribes, big game, and bird life, treatise, (49) 847.

Savoy, nutritive value, (41) 557.

Sawan disease survey from India, (46) 544.

Sawdust—

hydrolyzed, feeding value, (45) Wis. 275; (47) 76, Wis. 479.

hydrolyzed, preparation and analysis, (45) 202.

insulating value, (44) 588.

poisoned bait for grasshoppers, (48) Mich. 251.

reaction products of fusion with alkali, (41) 314.

Sawflies—

affecting roses, (47) U.S.D.A. 58.

differentiation, (43) U.S.D.A. 363.

dipterous parasites of, (45) 363.

Harris collection, (44) 356.

larvae and adults, homologies, (46) 464.

leaf-eating, on cereals, (49) 256.

neotropical, descriptions, (45) 860.

new genera and species, (45) 860.

North American, new species, (46) 661.

terminal abdominal structures, (45) 860.

Sawfly—

black grain-stem of Europe, (43) U.S.D.A. 363.

injurious to pines, (47) U.S.D.A. 163.

Leconte's, life history, (45) 159.

larvae, North American, (47) 659.

leaf miners, notes, (41) 759.

life history, (45) Conn. State 148.

web-spinning, notes, (41) S.Dak. 251; (44) S.Dak. 555, S.Dak. 652; (46) 58.

western grass-stem, studies, (43) U.S. D.A. 259.

western wheat-stem, in Canada, (48) 852.

western wheat-stem, summary, (47) 762.

Scabies—*see also* Mange and specific animals.

sarcoptic, in man and animal, (44) 376.

Scale, black, *see* Black scale.

Scale insects—

affecting mango, (43) 54; (47) 53, U.S.D.A. 359.

and fungi, simultaneous control, (47) 153.

and host plants, studies, (45) V.I. 149.

cage for rearing on plants, (50) 151.

catalogue, (46) 155.

citrus, fumigation, (41) 164, Calif. 550, 757.

control, (46) Mass. 50; (49) 654.

effect of lime-sulphur mixture, (48) 155.

generic host list, (42) 155.

in Hawaii, natural control, (47) 759.

in South Dakota, (41) 59.

notes, (42) 648; (45) V.I. 150; (46) 647; (47) Conn.State 156; (50) Mo. 257, V.I. 555.

of Australia, (42) 453.

of Australia, catalogue, (45) 456; (46) 559.

of Florida, (50) 155.

of Santa Cruz Peninsula, lists, (43) 851.

on date palm, (47) 758.

resistance to hydrocyanic acid fumigation, (48) 750.

Scale, scurfy, *see* Scurfy scale.

Scalecide, defense of, (47) 759.

Scalecide, fungicidal value, (43) Mass. 155.

Scalopus aquaticus machrinus, habits, (49) 50.

Scambus n.sp., parasitism by, (44) 356.

Scapteriscus didactylus, *see* Mole cricket.

Scapteriscus vicinus, *see* Mole cricket, Porto Rico.

Scarabaeidae, food plants, (48) 153.

Scatophaga stercoraria, Empusa disease in, (42) 361.

Scatophaga stercoraria, overwintering, (48) 157.

Scatopsidae of District of Columbia, (45) 760.

Sceloporus graciosus graciosus, food habits, (45) 358.

Schedius kuvanae, parasitism by, (46) 457.

Schedonorus hookerianus, analyses, (50) 168.

Schiffornis Bonaparte, notes on name, (44) 348.

Schistocerca—

peregrina, notes, (47) 552, 758.

spp. in Argentina, (45) 456.

spp., life history, (43) 159.

spp., notes, (42) Ariz. 357.

Schistocerca cornutus, notes, (48) V.I. 354.

Schistosoma japonicum, control, (42) 776.

Schistosoma japonicum, development, (45) 550.

- Schizaspidia tenuicornis*, life history, (50) 459.
- Schizoparme straminea*, origin of cavity in pycnidia, (49) 349.
- Schizophyllum*—
 commune, biology, (48) 247.
 commune, notes, (44) 751; (45) 649.
 sp., notes, (44) 48.
- Schizotetranychus schizopus*, notes, (50) Conn.State 50.
- Schizura unicornis* on hickory, (41) Conn. State 159.
- Schneideria metamorphosa* n.sp., notes, (47) 853.
- Schoenobius*—
 bipunctifer, notes, (42) 55, 451; (43) 52; (45) 359.
 incertellus on rice, (44) 250.
 incertellus, studies, (42) 55; (49) 556; (50) 756.
 punctellus on rice, (46) 458.
- School—
 and home cooking, textbook, (45) 93.
 and home gardening course, (41) Calif. 95.
 attendance v. farm labor, (44) 892.
 buildings, rural, improving, (49) 95.
 buildings, rural, score card for, (49) 95.
 children, act limiting labor by in Scotland, (41) 493.
 children, distribution of eggs to, (41) 396.
 children, energy expenditure and food requirements, (49) 762.
 children, heights and weights, (47) 561.
 districts, rural, social surveys of, (43) 598.
 fairs in Canada, (41) 495; (42) 599, 693.
 Folk High, at Roskilde, (47) 495.
 gardening—*see also* Gardening.
 directions, (42) 496.
 hints, (43) 797.
 in India, (41) 697.
 in Los Angeles, (43) 795.
 in New Hampshire, (44) 897.
 in New York City, (42) 91.
 papers on, (45) 398.
 value, (43) 796, 898.
 grounds, design and improvement, (45) 698.
 grounds, rural, planning, (50) Mich. 442.
 lunches, (43) 663; (45) 697; (46) 792; (50) 298.
 lunches and health education, (45) 63.
 lunches, bibliography, (45) 61.
 lunches in rural schools, (47) 97.
 lunches, organization, (44) 597.
 of agriculture and viticulture in Dalmatia, (50) 600.
 of Agriculture of University of Cambridge, (49) 493.
- School—Continued.
 of agronomy of Bogota, (46) 392.
 of farm home management in Algiers, (46) 898.
 of Forestry, Yale, progress, (44) 896.
 officials, rural, training, (48) 95.
 on wheels, notes, (49) 500.
 social center, history and description, (46) 596.
 State, at Geisenheim-on-the-Rhine, history, (48) 794.
 supervision, rural, circular letters in, (49) 95.
 surveys, (47) 96.
 teachers, rural, qualifications, (46) 93.
 winter, for farmers, (46) Wash. 297.
- Schools—
 agricultural, *see* Agricultural schools.
 continuation, for gardeners in Germany, (48) 96.
 elementary, junior club activities, (46) 897.
 elementary, lessons on food values, (43) 97.
 elementary, nature study in, (42) 693.
 evening, home making education in, (48) 897.
 Federal aid for, (46) 193.
 for farmers' children, (47) 298.
 gardening and horticultural, in Norway, (45) 398.
 high, relation to trade areas, (42) Wis. 394.
 high, winter short course in vocational agriculture, (48) 191.
 home economics, administration, (43) 494.
 home economics instruction in, (44) 698.
 in Texas, choice of subjects, relation to mentality, (50) 296.
 junior extension work in, (49) 96.
 junior high, household arts for, (46) 597.
 junior high, in rural sections, (49) 695.
 normal, rural education departments in, (48) 96.
 of agriculture, winter, in France, (50) 597.
 of agronomy in Peru, (47) 194.
 of New Jersey, helping teacher in, (48) 895.
 one-teacher, daily programs, (47) 299.
 one-teacher, industrial arts problem, (48) 896.
 one-teacher, instruction and facilities, (46) 897.
 part-time, introductory course, (45) 297.
 part-time, organization, (44) 391.
 professional continuation, for farm children in Belgium, (49) 95.
 public, in Virginia, survey, (44) 296.
 Rosenwald, in Virginia, (46) 897.

School—Continued.

rural—

- americanization through, (48) 599.
- and teachers' houses in England, (46) 94.
- and town, achievement in, (47) 96.
- arithmetic problems for, (43) 495.
- conditions in Ohio, (43) 898.

rural consolidated—

- and motor transportation, (44) 897.
- and one-room, (47) 495.
- and one-teacher, comparison, (49) 896.
- in Middle West, (48) 96.
- papers on, (48) 895, 896.
- teacher training for, (50) 195.
- treatise, (43) 297.
- value, (49) 393.

rural, consolidation—

- and transportation of pupils, (50) 93, 297.
- and transportation of pupils, bibliography, (48) 599.
- national conference, (45) 296.

rural—

- county system of agricultural instruction in, (48) 190.
- curricula, (48) 96.
- democratized, papers on, (48) 96.
- desirable future developments, (48) 598.
- elementary, State courses, (49) 694.
- farm accounting in, (50) 195.
- financial support, (48) 95, 96.
- health education in, (46) 194.
- health survey in Missouri, (49) 193.
- high, farm shop work for, (49) 195.
- high, of New York State, (48) 793.
- home geography for, (47) 299.
- hot lunches in, (41) 68; (44) 393.
- improving by standardization, (48) 95.
- in New York State, (46) 294; (47) 96, 494, 597; (48) 793; (49) 194.
- in Wisconsin, teacher training, (49) 96.
- Junior Club activities in, effects, (48) 96.
- lessons in rope work and wood, (44) 94.
- livestock management in connection with teaching, (49) 395.
- lunches, (48) 259.
- management, treatise, (50) 596.
- nature study for, (44) 391.
- objectives in elementary agriculture, (49) 597.
- of Delaware, (46) 94.

School—Continued.

rural—continued.

- of Maine, training supervisors, (46) 93.
- one-room, daily program, (46) 94.
- one-teacher, organization, (49) 296.
- organization and supervision, (47) 493.
- pageant for, (50) 95.
- planting grounds, (41) Mich. 46.
- recreation and play for, (49) 96.
- reorganization, (43) U.S.D.A. 492.
- reorganization in Germany, (44) 695.
- rooms and equipment for agricultural instruction, (48) 394.
- sociology and economics in, (44) 897.
- status of teachers in, (49) 597.
- successful teaching in, (46) 791.
- supervision, (46) 294, 896; (48) 393, 895.
- supervision, treatise, (46) 392.
- survey, (45) 398.
- teachers for, (48) 96.
- tests in, (46) 94.

secondary, rural bias in, (46) 791.

- serving milk in, (47) 280; (49) 277.
- small community high, (48) 895.
- small holdings, in Norway, (48) 496.
- small holdings, in Norway, teacher training, (50) 94.
- vocational, *see* Vocational schools.

Schotia seed, composition, (48) 68.

Sciara—

- coprophila metamorphosis, correlation of life cycle of parasite with, (47) 853.
- militaris, biology, (50) 255.
- trifolii on red clover, notes, (42) 743.
- Sciaridae on indoor cucumber plants, (49) 254.

Science—

- and economics of daily life, (42) 91.
- and fruit growing, (42) 105.
- children's interest in, (44) 698.
- for children, treatise, (44) 494.
- national temple of, editorial, (50) 601.
- outline, treatise, (48) 498.
- remaking the world, treatise, (50) 897.

Scientific—

- illustrations, preparation, (45) 658.
- institutions, research spirit in, (43) Tex. 496.
- terms, dictionary, (45) 299.

Scientists, Government, conditions of service, (43) 798.

Sciomyzidae, synoptic keys, (45) 257.

Scirpus americanus, analyses, (41) Wyo. 333.

Scitula pruinosa, notes, (41) 666.

Sclerospora—

- graminicola, notes, (42) 350; (48) 145.

Sclerospora—Continued.

- javanica, notes, (45) 844; (47) 751.
 maydis, notes, (48) 145.
 philippinensis n.sp., description, (43) 545.
 sacchari on sugar cane, (48) 454.
 sp., notes, (46) 45.
 spontanea n.sp., description, (44) 843.
 spp., production and dispersal of conidia in, (49) 46.

Sclerostomes of donkey in East Africa, (42) 776.

Sclerostomum renium n.sp.—

- description, (50) 586.
 notes, (48) 679.

Sclerotinia—

- apothecia, relation to pH value, (50) 451.
 carunculoides n.sp., description, (47) 49; (49) 350.

cinerea—

- apothecia of, (50) 148, Md. 842.
 control, (50) Oreg. 842.
 effect on plums, (50) 47.
 enzymes of, (42) Minn. 841.
 notes, (44) Calif. 648, Minn. 746; (47) 151, 152, 355, 546; (48) Calif. 541.
 pectin relations, (44) 825.
 pruni, notes, (49) 248.
 studies, (47) Calif. 649.
 vitamin requirements, (42) 433, 758.

demissa n.sp., description, (48) 644.

fructigena, conidia of, (45) 146; (48) N.H. 544.

fructigena, notes, (41) 53; (46) 453; (49) 44, 45.

fructigena on apricots, (46) 47.

fructigena, studies, (50) 552.

fruit rot on tomato, (43) Md. 151.

gregaria n.sp., description, (48) 644.

libertiana—

- control, (49) 246; (50) Mass. 651.
 in greenhouse, control, (50) 549.
 notes, (41) N.J. 50; (42) N.Y. State 350; (44) Mass. 445; (45) 47; (46) 847, 849; (47) 349, Pa. 445; (48) 245, N.J. 347, 348; (49) Mont. 148, Calif. 649, 650, 844; (50) 248, Pa. 445, 655, 751.

on greenhouse lettuce, (43) Ky. 845.

studies, (43) 247; (47) N.J. 149.

utilization of citric acid by, (50) 630.

longevity in soil, (41) 844.

mespili, conidial stage, (45) 822.

mespili, notes, (49) 250.

minor n.sp., description, (44) 643.

minor, studies, (45) Pa. 246.

n.spp., notes, (48) 143.

on onion, (41) 154.

oxycocci on cranberries, (45) U.S.D.A. 54.

Sclerotinia—Continued.

ricini n.sp., description, (43) 849.

ricini, notes, (48) 740; (49) 346.

sclerotiorum, notes, (44) 447; (46) 543; (48) 47.

sp., notes, (43) 154; (47) 348.

spp., notes, (42) 46; (43) 152, 246; (44) 48, 346.

trifoliorum, notes, (41) N.C. 450; (43) 46; (44) 734; (45) 447; (49) 44;

(50) Ohio 145, 447.

Sclerotopsis concava, origin of cavity in pycnidia, (49) 349.

Sclerotium—

bataticola, utilization of glucose as source of carbon, (45) 354.

bifrons on aspen, (45) 549.

clavus, notes, (48) 432.

coffeicolum n.sp., studies, (47) 153.

griseum n.sp., description, (42) 46.

oryzae, notes, (41) 841; (45) 650.

rolfsii—

acid requirements, (49) Ga. 537.

notes, (41) 156; (42) Hawaii 543;

(44) Hawaii 47; (48) 455; (49)

Ga. 346, N.C. 747.

parasitism on potatoes, (48) 452.

studies, (42) 351; (47) Ga. 444.

setosum, notes, (50) 547.

sp., notes, (42) 147, 643; (43) 45;

(46) 45; (49) Ky. 541; (50) 547.

spp. in soil, damage from, (41) 655.

spp. on rice, (45) 749.

stellatum n.sp., description, (46) 243.

stem rot of rice, (48) 846.

Scobicia declivis, biology and control, (48) U.S.D.A. 55.

Scoleotrichum graminis, notes, (41) 843.

Scolia manilae—

n.sp., description and life history, (42) 550.

notes, (43) 52; (45) 551; (47) 253.

progress in Hawaii, (42) 160.

Scolopacidae, subfamilies. nomenclature, (42) 355.

Scolytidae, food plants, (48) 153.

Scolytoplatus, biology and anatomy, (47) 856.

Scolytus—

ratzeburgi, notes, (41) 455; (44) 250.

rugulosus, *see* Shot-hole borer.

spp. and parasites on fruit trees, (46) 253.

Scopolamine from Datura metel, (41) 825.

Scopolamine, source, (44) 827.

Scotothorus Oberholser, notes on name, (44) 348.

Scours in calves, (49) Calif. 79.

Scrapie, effect of nutrition, (50) 266.

Scrapie, studies, (41) 85, 580.

Screen wire, durability tests, Wyo. (43) 189; (45) 478.

Screenings—

analyses, (41) Can. 565.

feeding value, (41) Can. 569.

re-cleaned, feeding value, (43) 774.

- Screw pine, bud sport from, (42) 141.
- Screw worm—
control, (49) 356.
flies, flight distances, (41) 259.
summary, (45) Tex. 455.
- Scrophulariaceae—
and Orobanchaceae, morphological continuity, (47) 126.
specialization of *Peronospora* on, (43) 247.
- Scrubbing floors, energy expenditure, (44) 66.
- Scurfy scale in South Dakota, (41) 59.
- Scurvy—
among troops in Mesopotamia, (43) 262, 263.
and prophylaxis in British Navy, (44) 361.
as affecting teeth, (41) 471.
beading of ribs in, (43) 369.
blood picture in, (46) 762.
changes in blood and vascular system in, (46) 474.
cured by boiled milk diet, (46) 360.
effects of malt, (42) 463.
etiology, (48) 865.
experimental, changes in weight of organs, (49) 162; (50) 465.
experimental, in rabbits, (46) 474.
experimental, studies, (47) 568; (50) 64.
in guinea pigs, effect of unbalanced diet, (46) 64.
in North Russia, (44) 262; (45) 467.
in pigs, notes, (44) 766.
in the World War, (46) 261.
infantile, studies, (43) 667; (45) 767.
notes, (42) 463; (44) 361.
prevention for a polar expedition, (46) 360.
prevention, rôle of vitamins in, (45) 867.
production on vitamin C deficient diet, (50) 166.
progress in thyroidectomized guinea pigs, (49) 766.
review of literature, (44) 63, 362.
studies, (41) 266, 365, 470, 562, 860; (43) 461, 567, 568; (44) 466; (45) 663.
treatise, (45) 266.
- Scutelleroidea of Iowa, (44) 352.
- Scutellista cyanea, parasitism by, (47) 363.
- Scymnus binaevatus, introduction into California, (50) 661.
- Scymnus sordidus, notes, (47) U.S.D.A. 159.
- Scyphophorus acupunctatus, notes, (42) 751; (46) 58; (47) 761.
- Sea sand, fertilizing value, (48) 522.
- Sea sediment, content and value, (50) 213.
- Sea slugs, fertilizing value, (45) Guam 23.
- Sea water—
effect on cement, (50) 187.
nitrification in, (48) 619.
- Sea water—Continued.
salts, fertilizing value, (41) 723.
zinc and copper in, (49) 258.
- Seacoast flea-beetle on sugar beets, (48) 57.
- Seagrass meal, feeding value, (42) 369.
- Seal meat, digestibility, (44) 661.
- Seal sausage, description and analyses, (42) 552.
- Seals, sarcosporidian parasite of, (48) 151.
- Seasons, variability in different years, (42) 714.
- Seaweed—
as source of potash, (42) 723.
fertilizing value, (41) 229; (45) Guam 23.
ground, feeding value, (42) 369.
ground, fertilizing value, (43) Can. 727.
vitamin A in, (46) 357.
- Sébakh, fertilizing value, (48) 819.
- Secale cornutum, notes, (48) 432.
- Secretin—
and vitamin B, identity, (41) 267; (44) 766; (45) 665; (46) 761.
effect in anemia, (46) 760.
effect on metabolism, (43) 369.
- Sedges—
analyses, (41) Wyo. 333.
rôle in Colorado plant communities, (43) 129.
Toxoptera on, (42) 155.
- Sediment, value in plant nutrition and soil improvement, (50) 212.
- Sedimentation cylinder, Sikorsky's, (50) 14.
- Sedoheptose, new sugar from, (43) 801.
- Sedum spectabile, new sugar from, (43) 801.
- Seed—
analysts, responsibility, (44) 233.
and weed control in Wisconsin, (45) 537.
bed diseases, (43) 150.
bed preparation, (43) 321.
breeding station, German-Swedish, at Derenburg, (49) 232.
certification—
and listing, (50) N.Dak. 35.
in Germany, (47) 739.
in Virginia, (50) 641.
standardization, and listing, (41) 536.
system, (48) 136.
cleaning process, new, (46) 232.
coat, selective permeability, (48) 329.
collected in New York State, analyses, (48) 233.
control, aspects of, (41) U.S.D.A. 442.
control service in Denmark, (46) 36; (49) 232.
diseases, studies, (43) Md. 151.
disinfection, (45) Ind. 248.
grain certification in Germany, (50) 439.

Seed—Continued.

- grain treatment, machine for, (47) Wash. 648.
- Growers' Association in Canada, (44) 531.
- Growers' Association, relation to Idaho agriculture, (44) 143.
- identification, (44) 143.
- identification, treatise, (48) 836.
- Importation Act, operation, (44) 233.
- industry, better standards, (45) 537.
- industry in Germany, treatise, (49) 232.
- industry in United States, (41) U.S.D.A. 645.
- industry, square dealing in, (44) 143.
- infection, internal, methods of study, (45) 844.
- inspection, (41) Mont. 40, N.H. 40, N.Dak. 140, Idaho 225, Idaho 339, Colo. 645; (42) Md. 137; (43) Vt. 437; (44) Me. 439; (45) Md. 438, Vt. 833; (46) Md. 233, Vt. 536; (47) Iowa 234, Me. 436, N.J. 436; (48) Ind. 532, Md. 532, Vt. 634; (49) Me. 232.
- inspection—
 - and analysis, (42) N.J. 830.
 - and certification, (44) 632.
 - and certification, regulations, (46) 36.
 - in Denmark, (41) 228.
 - in England and Wales, (50) 338.
 - in New Zealand, (41) 442.
 - in Pennsylvania, (42) 238.
 - in Scotland, (44) 143.
 - in Sweden, (43) 35.
 - in Vermont, (50) Vt. 338.
 - in Virginia, (45) 637; (47) 234.
 - in Wisconsin, (49) 100; (50) 338.
 - in Zurich, (41) 729.
 - of lawn-grass mixtures, (41) N.J. 40.
 - value to farmer, (43) U.S.D.A. 437.
- laboratory, use, (50) N.Dak. 439.
- law, (41) Idaho 236; (43) Me. 337; (44) N.Y.State 439; (47) Ind. 138, N.H. 138, N.J. 234; (50) Idaho 35, N.Dak. 35.
- law in Canada, (50) 539.
- law in Colorado, (43) Colo. 337.
- law in Great Britain, (45) 833.
- law in Iowa, (45) 833.
- law in Nebraska, (45) 833.
- law in Scotland, (46) 233.
- law in Washington, (47) 534.
- law, new, of Missouri, (45) 344.
- law, new, of Utah, (44) 143.
- laws in United States, (44) 232.
- legislation and regulation, (44) 232.
- marketing hints, (46) U.S.D.A. 137.*
- preservation in unfavorable weather, (48) P.R. 227.
- production, (41) U.S.D.A. 442; (46) 336; (47) 226; (48) Can. 31.
- production in England, (45) 637.

Seed—Continued.

- production in Great Britain, (41) 737.
- production in Great Britain, treatise, (42) 534.
- production in Poland, (50) 439.
- production in Sweden, (45) 740.
- production on Long Island, (45) 44.
- products, transactions in, rules, (46) 32.
- regulations in Great Britain, (48) 338.
- regulations in Indiana, (46) 536.
- regulations in Ireland, (47) 39.
- reporting as a public service, (41) 737.
- reports, U.S.D.A. (41) 235, 442, 537, 645; (42) 36.
- respirometer for, (48) 624.
- sampling device, (43) U.S.D.A. 642.
- selection, (46) 830.
- selection for increasing yields, (48) N.C. 528.
- separator, air-blast, modifications, (46) 732.
- situation in Idaho, (44) 143.
- stocks, war committee on, (42) 36.
- storage rooms, insect control, (47) Ohio 358.
- tester, rag doll and germinator box, (43) Ind. 135.
- testing, (41) Iowa 40, 730; (44) 232, N.Y.State 439; (45) Idaho 235.
- testing—
 - in Bavaria, (45) 833.
 - in Belgium, (50) 833.
 - in England and Wales, (43) 642; (47) 829.
 - in North Carolina, (50) 833.
 - in Scotland, (46) 137; (48) 532.
 - in Wyoming, (42) 238.
 - methods, (49) Mont. 831.
 - papers on, (50) 237.
 - regulations, (45) Ariz. 740.
 - regulations in Great Britain, (42) 439.
 - station in Denmark, (43) 832; (46) 37, 545.
- tests, results, (50) Idaho 35.
- tests, results, N.H. (45) 133; (47) 138; (48) 735.
- trade, responsibilities, (41) 737.
- trade rules, (45) 832.
- treatment, (41) Mich. 654, N.J. 654, 737, 754; (42) Calif. 47, 146, 147; (43) 153, 244, 845; (44) 221. Oreg. 841; (45) 48, 747, 846; (46) 545; (50) 546.
- treatment by formaldehyde vapor, (41) 154, 245.
- treatment, electrical, (44) 137, 232, 519; (46) 225.
- treatment for dodder control, (41) 646.
- treatment, formaldehyde method, modification, (48) 545.
- treatment, injury from, (44) 540.
- treatment of forest trees, (47) 241.
- treatment, presoak method, (41) 246; (43) 844.

Seed—Continued.

- treatment with ammonium nitrate, (41) 730.
- treatment with Uspulun, (44) 243; (49) 839.
- values, biochemical tests, (50) 222.
- Seedcorn maggot—
 - as a bean pest, (41) 259.
 - notes, (42) N.J. 849; (44) N.J. 350; (48) U.S.D.A. 52, Ariz. 457, Mass. 650, 651.
 - on Lima beans, (41) N.J. 58.
 - on tobacco, (47) Conn.State 155; (48) 56.
 - studies, (47) N.Y.Cornell 848.
- Seeder, tree, description, (42) 488.
- Seeding machine for different seeding widths, (43) 691.
- Seeding machines, tests, (50) 687.
- Seeding, spring, suggestions, (49) Mich. 37..

Seedlings—

- cruciferous, failure of, (42) 46.
- effect of stimuli on, (42) 729.
- growth as affected by reaction of solution, (43) 524.
- nutrition, function of calcium in, (47) 224.
- polycotylous, vascular anatomy, (42) 725.
- translocation of mineral constituents, (45) 124.

Seed-O-San, fungicidal value, (49) 645.

Seeds—

- absorbing powers, (47) 730.
- Act, 1920, (50) 237.
- action of hydrocyanic acid on, (45) 29.
- after-ripening and germination, (42) 432.
- after-ripening, temperatures, (44) 233.
- agricultural, determination of origin, (50) 237.
- analysis, (42) N.Y.State 340; (44) 412; (48) N.J. 337.
- analysis for fat and moisture content, (41) 501.
- analysis, methods, (50) 338.
- and water mixture, changes of volume in, (48) 430.
- appearance, relation to germinating and yielding capacity, (50) 636.
- as affected by chloropicrin, (45) 537; (47) 222, 542.
- as affected by drying, (41) 730.
- as affected by imperfect fungi, (41) N.Dak. 140.
- as affected by radium, (47) 426.
- as carriers of plant diseases, (42) 447.
- collection and exchange in Hawaii, (45) 745.
- coniferous, origin, extraction, and value, (42) 739.
- contributions to adult plant, (50) 125.
- development, effect of endosperm, (46) 722.

Seeds—Continued.

- development, effect of lime, (50) 325.
- differentiation by serum reactions, (43) 206.
- direct contact of fertilizers with, effect, (50) N.J. 215.
- disinfection with bromin, (42) 146.
- dormant, respiration, (47) 730.
- Dutch, urease content, (43) 802.
- effect of physiological condition on growth and yield, (43) 224; (44) 628.
- effect of temperature on soaking, (44) 628.
- effect on pH of solutions, (50) 523.
- fertilizing before planting, (48) 529.
- forest, characteristics, (47) 747.
- forest, germination, relation to soil moisture, (45) 140.
- forest, germination studies, (49) 141.
- fumigated, hydrocyanic acid absorbed by, (49) U.S.D.A. 456.
- fumigation with carbon bisulphid, (42) Calif. 848.
- germinability, coloration as test, (50) 325.
- germinability, factors affecting, (45) 28, 526.
- germinated, antiscorbutic value, (42) 57.
- germinating, heat production by, (45) 125.
- germinating, oxygen absorption, demonstration, (46) 432.
- germination, (45) 832.
- germination as affected by—
 - acids, (47) 627.
 - alkali, (41) 622.
 - alternating temperature, (49) 221.
 - carbon bisulphid, (49) 849.
 - cold, (45) 429.
 - dry heat, (45) Wis. 244.
 - fertilizers, (44) Va. 721.
 - light, (42) 730; (48) 626.
 - organic substances, (41) 523.
 - reaction of solution, (43) 524; (50) 627.
 - resting period, (42) Wis. 338.
 - selenium and radium, (50) 325.
- germination—
 - capacity and tendency, (44) 821.
 - daylight, (50) 34.
 - delayed, (44) 133.
 - in heated soils, (41) 215.
 - inhibiting substances and false germination, (49) 221.
 - papers on, (46) 731.
 - physiology, (47) Minn. 348.
 - rate, relation to temperature, (49) 522.
 - studies, (45) 221, 832.
 - tests, (43) N.H. 35.
 - tests, device for placing seeds, (44) 233.
 - tests, status of methods, (50) 238.

Seeds—Continued.

- germless, in corn, (50) 528.
- good, importance, (44) Ohio 739.
- good, interest of farmers in, (42) N.C. 791.
- grading, (45) 832.
- graminaceous, rust in, (48) 451.
- green, germination, (48) 827.
- hemicellulose-splitting enzym in, (46) 69.
- immature, germination, rôle of seed coat in, (45) 221.
- imports, U.S.D.A. (42) 336; (43) 635; (46) 29; (47) 129, 426; (48) 128, 730; (49) 128, 426, 523; (50) 225, 428.
- initial weight, effect on plant growth, (50) 821.
- insects affecting, (45) 552.
- iron and manganese content, (49) 202.
- labeling by seedsmen, (44) 233; (46) 732.
- longevity, (43) 832; (44) Ohio 736.
- mites attacking, (45) 861.
- moisture intake as affected by temperature, (44) 728.
- new, germinability, (46) 722.
- noxious weeds in, (42) 238.
- of coniferous trees, storage, (47) 145.
- of Scotch pine, viability, factors affecting, (49) 744.
- oil—*see also* Oil seeds.
vitamin A in, (49) 59.
- 1,000-kernel weight, relation to experimental error, (48) 627.
- paired, of cocklebur, germination, (43) 431.
- paper packet, (44) 233.
- papers on, (50) 739.
- pectin content, (44) 111.
- pedagogy of, (41) 597.
- pedigreed, inspection, (42) 530.
- preservation, (41) P.R. 147.
- purity and germination tests, (49) N.J. 635.
- reduction of nitrates by, (49) 213.
- relation between germinability and respiration, (42) 227.
- scarified hard, germination, (48) 634.
- size of, as affecting yield, (41) 536.
- small-kerneled, determining purity, (45) 832.
- sprouting, fungi on, (49) 443.
- standardization and certification, (44) 233.
- standards for, (44) 413.
- stimulation, (50) 643.
- studies, (50) Minn. 137.
- sulfonated, substitute for sulfonated castor oil, (44) 205.
- toxic effect of gases on, (44) U.S.D.A. 55.
- translocation of mineral constituents, (41) 726.
- unfree water in, occurrence, (44) 728.
- urease in, (43) 10.

Seeds—Continued.

- viability, determination, (50) 507.
- viability, relation to heat, (41) 430; (44) 233.
- vitality, (46) 323.
- weed, *see* Weed seeds.
- weight, effect on resulting crop, (50) 636.
- weights of, from Indian trees, (49) 141.
- winged, fall of, (46) 41.
- Seepage in distribution laterals, (49) Mont. 184.
- Segment blocks for large-size drains, (41) 483.
- Sesquidilla, notes, (48) Guam 228.
- Selachyl alcohol from fish liver oils, (47) 311.
- Selaginella kraussiana, cellular elements in, (44) 822.
- Selection—
developmental, of vascular plants, (49) 425.
- effect on Mendelian ratio, (49) 769.
- experiments with *Drosophila*, (41) 868; (42) 767.
- experiments with inbred rats, (41) 865.
- experiments with rats, (42) 762.
- for sex ratio, (41) 866.
- natural, action on Mendelian characters, (41) 268.
- through seeds from dominant plants, (48) 528.
- Selenium—
action on molds in cheese, (45) 477.
- determination, (45) 110.
- effect on plant development, (50) 325.
- effect on seed germination, (50) 325.
- oxidation, (49) 23.
- substitution for sulphuric ion in Knop formula, (49) 126.
- Selenothrips rubrocinctus—
control in Trinidad, (42) 357.
- on avocado, (42) 546.
- Self-feeders—
for calves, (44) 271; (49) Mont. 172; (50) 579.
- for cows, tests, (42) Va. 471.
- for pigs, (42) Mont. 86; (43) 71, 485; (45) Can. 875; (48) Iowa 767; (49) Can. 68, 169, Pa. 271, Iowa 572; (50) 272.
- Sembu, culture directions, (45) 35.
- Semimnatha fumosa, notes, (42) 361.
- Seminal gland and secondary sex characters, independence, (47) 570.
- Seminal vesicles, effect of gonad hormones on, (49) 463.
- Seminiferous tubules, nature of ovum-like bodies in, (48) 766.
- Senescence in plants, (48) 829.
- Senescence in white mice, (41) 766, 767.
- Senna, culture in the Sudan, (45) 538.
- Sensitive brier, summation of dissimilar stimuli to, (47) 328.

Sepsis sp., overwintering, (48) 157.
 Sepsis, treatment with horse serum, (43) 684.
 Septanynchus, new genus, erection, (42) 551.
 Septic tanks—
 and tile sewage disposal system, (50) Mich. 289.
 bacterial action, (47) Idaho 794.
 construction, (41) Wash. 692; (46) 492; (47) 892.
 for sewage disposal, (43) 893; (45) Mont. 187, 491.
 Michigan, (45) Mich. 698.
 new form, (41) 589.
 planning and construction, (48) 186.
 purification in, (44) 187.
 station projects on, (48) 199.
 Septicemia—
 contagious, of swine, (45) 881.
 hemorrhagic, (41) 474, 777; (44) 579.
 hemorrhagic—
 and oak poisoning, (48) 482.
 bacilli, heat-killed, immunizing value, (46) 181.
 bacillus in aborting sheep, (42) 273.
 control in Alabama, (42) 776.
 diagnosis, selection and shipping of material, (45) 381.
 forms and treatment, (48) 279.
 group, differentiation of organisms, (49) 478.
 immunization, (47) 285; (48) Nebr. 82; (49) Colo. 476.
 in camels, (41) 86.
 in England, (48) 482.
 in hares, (47) 589.
 in lambs, (41) Iowa 286.
 in sheep, (41) 479; (42) 878, Calif. 884; (49) 283.
 in swine, (43) Ind. 385; (45) 73.
 organism, virulent and nonvirulent strains, (47) 183.
 relation to sweet clover poisoning, (49) 178.
 studies, (47) Nebr. 787; (48) 579; (49) Oreg. 582.
 summary, (50) 79.
 treatment with flavin, (43) 79.
 v. hog cholera, (43) 683.
 vaccines, value, (45) 578.
 value of vaccines or bacterins for, (43) Nebr. 882; (44) 580.
 infectious, prophylaxis and treatment, (41) 577.
 Septogloeum arachidis, notes, (46) 648.
 Septogloeum mori, notes, (47) 839.
 Septoria—
 antirrhini, notes, (46) 654.
 apii, control, (49) Mich. 443.
 apii on celery, (45) 748.
 biologic specialization, (41) 544.
 callistephi n. sp., notes, (47) 548.
 consimilis on greenhouse lettuce, (43) Ky. 845.
 diseases of cereals, (50) 648.
 glumarum, studies, (43) Can. 750.

Septoria—Continued.
 iris, studies, (47) 541; (48) 746.
 leaf blight on tomatoes, (42) 349.
 leaf spot of *Rubus*, (48) 848.
 lycopersici—
 control, (41) N.J. 52; (46) Va. Truck 336; (48) 645; (49) Pa. 348.
 effect of fertilizers and lime, (50) 47.
 notes, (42) 48; (43) Md. 151, 154; (45) Okla. 449, 546, 842; (46) Mass. 43, 46, 451, 745; (47) 753; (49) 149.
 on tomatoes, (43) 243, 244; (44) 49; (45) 47.
 negundinis in Zion National Park, (48) 249.
 nodorum, notes, (47) Ark. 748.
 of wheat, studies, (44) 539.
 paeoniae berolinensis, notes, (50) 355.
 petroselini apii, studies, (41) N.J. 50; (50) 651.
 petroselini on celery, (45) 47.
 pyricola, notes, (46) 543.
 rhoina, description, (43) 49.
 rubri, notes, (45) 751.
 sp., notes, (44) 48, Conn.State 150.
 species, tabulation, (46) 431.
 Sequoia, seed production and viability, (48) Calif. 540.
 Sequoias of Southwest, growth studies, (47) 820.
 Sereda, new genus, erection, (49) 760.
 Sericulture—*see also* Silk and Silkworms.
 conditions for, (42) 152.
 handbook, (42) 546.
 in California, (42) Calif. 848.
 in China, (42) 640.
 in France, (42) 396.
 in Germany, (41) 847.
 in Mysore, (41) 59.
 in Pusa, (42) 647.
 in the Far East, (41) 458.
 possibility in America, (43) 557.
 Serology and serum diagnosis, treatise, (46) 276.
 Serradella—
 brown hay, loss of nutrients in, (49) 669.
 culture on sandy soils, (41) Wis. 18.
 germination as affected by organic substances, (41) 523.
 Serratulin in plant cells, (42) 333.
 Serum—
 and vaccine therapy in horse diseases, (45) 385.
 and vaccine therapy, principles, (45) 382.
 calcium determination in, (46) 203; (47) 14; (50) 112.
 calcium in, microdetermination, (45) 316.
 coagulable protein in, (45) 14.
 diagnosis, treatise, (46) 276.
 heating, constant-temperature bath for, (45) 681.

Serum—Continued.

- high titer, production, (45) 280.
- industry, state laws for, (42) 877.
- inorganic phosphorus in, (47) 13.
- insoluble, use, (45) 75.
- institute in Holland, reports, (41) 474.
- magnesium determination in, (46) 203; (48) 11.
- physiology, international catalogue, (43) 227; (44) 556; (46) 222.
- potassium determination in, (45) 507.
- precipitin, effect on species furnishing antigen, (42) 566.
- production, use of centrifuge for, (44) 876; (46) 881.
- protein, separation, (45) 203.
- proteins of blood at different ages, (42) 866.
- proteins of blood, regeneration, (41) 859.
- reactions for tests of seeds and feeding stuffs, (43) 206.
- sickness from bovine serum, (42) 567.
- sickness in cattle and horses, (47) 584.
- sodium determination in, (45) 716; (47) 13.
- therapeutic and diagnostic, increasing yield, (50) 583.
- therapeutic, purification, (45) 75.
- therapy and anaphylaxis in veterinary practice, (41) 185.
- therapy of wounds and pyogenic infections, (41) 188.
- treatment of epizootic lymphangitis, (44) 579.
- treatment of joint-ill, (42) 679, 680.
- vaccinal, action of euglobulin, (42) 475.
- vaccination for foot-and-mouth disease, (44) 779.
- vaccination for rinderpest, methods, (42) 568.

Serums—

- administration by respiratory tract, (43) 581.
- agglutinating, as affected by an electric current, (43) 781.
- antistreptococcic, from horses immunized by single dose, (41) 376.
- antitoxic, comparison of precipitating agents, (42) 775.
- antitoxic concentrated, potency, (42) 474.
- antitoxic, concentration, (41) 874.
- antitoxic, studies, (41) 282, 283; (42) 558; (43) 76.
- as new and nonofficial remedies, (41) 781; (43) 470.
- bovine, for treatment of disease, (42) 567.
- clinical value, treatise, (41) 283.
- effect on velocity of bacteriolysis, (41) 187.
- fractionation, (41) 282, 283.
- guinea pig, complement-deficient, (43) 273.

Serums—Continued.

- guinea pig, composition, (41) 187.
- guinea pig, loss of complement at various temperatures, (41) 477.
- horse and goat, as affected by desiccation, (41) 874.
- horse, for human septic wounds, (43) 684.
- immune, behavior of antibodies in, (42) 73.
- immune, coagglutinins in, (43) 581.
- immune, complement deviation in, (43) 382.
- immunizing, isoanaphylactic poisoning by, (41) 185.
- manufacture in India, (42) 675.
- measuring, (41) 203.
- new preservative for, (45) 881.
- normal and immune, comparison, (42) 176.
- preparation, (45) 682.
- preparation and preservation, (42) 73.
- prophylactic and curative value, (41) 576.
- technique, treatise, (44) 475.

Service men—

- agricultural education in France, (42) 493.
- agricultural instruction for, (41) 95, 200, 596, 797; (42) 500; (43) 93, 395.
- agricultural instruction in Canada, (42) 698.
- agricultural opportunities in Italy, (42) 800; (43) 93.
- agricultural opportunities in Tropics, (43) 93.
- agricultural training, (44) 390.
- agricultural training in Great Britain, (47) 896.
- colonization by, treatise, (41) 592.
- disabled, agricultural training for, (46) 193.
- employment on the land, (41) 591, 889.
- farm colonies for, (43) 93.
- farm gardening for, (43) 898.
- forestry pursuits for, (42) 44.
- land settlement for, (41) 193, 489, 792, 889; (42) 88; (43) 93; (44) 289, 788.
- loans for, (43) 93.
- opportunities in agriculture for, (41) 296, 392.
- rehabilitation, (44) 794.

Sesame—

- breeding experiments, (49) 735.
- cake, value, (47) 69, 472.
- culture and expression of oil, (43) 240.
- culture and use in Uruguay, (45) 35.
- culture directions, (45) 35.
- culture experiments, (44) 733.
- culture in Burma, (41) 529; (42) 436.
- culture in the Sudan, (45) 538.
- fertilizer experiments, (44) 733.
- oil, detection in olive oil, (46) 710.
- oil, food value, (45) 367.
- oil, production, (46) 636.

Sesame—Continued.

- production in French colonial possessions, (42) 32.
- variety tests, (44) 733.
- Sesamia inferens*, notes, (45) 359; (47) 357.
- Sesamia nonagrioides*, notes, (50) 846.
- Sesamum indicum* cake, fertilizing value, (41) 816.

Sesbania—

- composition, (43) 170.
- seed, composition, (48) 68.
- seed, feeding value, (48) 660.

Sesia—*see also* Aegeria.

- acerni, notes, (50) Conn.State 50.
- rhododendri, notes, (50) Conn.State 50.
- tipuliformis, *see* Currant borer.

Setaria spp., parasites of cattle and other ruminants, (45) 77.

Setomorpha margalaestriata, notes, (42) 53.

Sewage—*see also* Tannery waste, Wool waste, *etc.*

- action of bacteria on, (47) 490.
- Bacillus botulinus* in, (49) 860.
- chemical changes and flora in, (50) 888.
- digestion tanks, nitrogen formation in, (50) 791.
- disposal, (41) 489, 587, 588, 589, Wash. 692; (46) 491.
- disposal—
 - and sewerage, treatise, (46) 891.
 - and utilization, (48) 123.
 - for isolated homes, (49) Mont. 184; (50) 190.
 - for rural homes, (43) 189, 290, 479; (46) 782; (49) 890.
 - in Tropics, (43) 691.
 - on the farm, (42) 481, 788; (43) 893; (44) 87, 88, 383, 589, 888; (45) Mont. 187, 792; (46) U.S.D.A. 891; (47) 92, 489, 593.
 - projects, (50) 97.
 - septic tanks for, (48) 186.
 - small community, (43) 189.
 - studies, (47) 26, 593, 688.
 - subsurface, (44) 589.
 - system, problem of freezing in, (48) 386.
 - system, tile, and septic tank, (50) Mich. 289.
 - systems, automatic siphon for, (49) Ind. 596.
- effluent, purification by clay, (48) 786.
- examination, standard methods, (44) 805; (50) 804.
- fertilizer and manure, comparison, (46) 319.
- filter fly, notes, (41) 165; (42) N.J. 849.
- filter, sprinkling, biology of, (45) N.J. 794.
- filters, insect life in, (42) 188; (43) 853.

Sewage—Continued.

- filters, treatment and use, (44) N.J. 321.
- from beet sugar plant, treatment, (43) 479.
- grease interception from, (41) 589.
- hydrogen sulphid determination in, (42) 207.
- investigations, (48) N.J. 354.
- irrigation plant in Florida, (44) 284.
- irrigation plant in Germany, (44) 381.
- liquid, phosphoric acid content, (48) 622.
- municipal, use for spray irrigation, (46) 88.
- nitrogen in, (44) 215.
- nitrogen recovery from, (43) 219; (50) 124.
- organisms, action on organic matter, (43) 791.
- phosphoric acid in, (42) 12.
- preliminary treatment, (43) 791.
- purification, (41) 801; (42) 188; (43) 190; (44) 187, 420.
- purification, bibliography, (45) 691.
- purification by denitrification, (50) 288.
- purification plant, injury from industrial sewage, (43) 691.
- purification, straw filters for, (45) 793.
- rates of oxidation, comparisons, (44) 186.
- settling periods, formula for calculating, (45) 188.
- siphons, design and principles, (44) 589.
- sludge—
 - as fertilizer, hygienic aspects, (50) 791.
 - by-products, (43) 520.
 - fertilizing value, (43) 221; (44) 24, 725.
 - new use as fertilizer, (45) 216.
 - pressing, (41) 814.
- soil, nitrifiability, (46) 516.
- soil pollution from, (46) 589.
- sprinkler nozzles, coefficients of discharge, (48) 387.
- stockyard, treatment, (46) 783.
- sulphur content, (50) 488.
- surface purification, (45) 187.
- treatment—
 - and disposal in United States, (42) 789.
 - effluent from, deoxygenating effect, (41) 888.
 - in Imhoff tanks, (46) 783.
 - treatise, (47) 293.
- trickling filters, vegetable growths in, (46) 492.
- tubercle bacilli in, destruction, (48) 685.
- water pollution from, (46) 589.
- Sewer pipe, supporting strength, (44) 83.
- Sewer tunnels, tables for designing, (46) 380.

Sewerage—

- and sewage disposal, treatise, (46) 891.
- works, design and construction, (47) 293.

Sewers, substitutes for, (45) 592.

Sewing—

- and cooking, elementary courses, (47) 598.
- and textiles, lessons, (45) 697.
- directions in, (46) 597.
- energy expenditure during, (44) 66; (49) 65.
- for girls, (49) 297.
- handbook for clothing club girls, (47) 598.
- increase in metabolism during, (42) 167.
- textbook, (41) 897.

Sex—

- character, secondary, genetic behavior, (45) 370.

characters—

- development, (50) 825.
- effect of sight on, (49) 164.
- formation, minimum of testicular substance for, (46) 266.
- in twin goats, (42) 561.
- secondary, formation by gonads, (45) 168.
- secondary, in *Ustilago violacea*, (49) 222.
- secondary, studies, (42) 466; (44) 468, 865; (47) 570.
- chromosomes of mammals, (50) 825.
- control, (48) 399.
- control in Cladocera, (49) 567.
- determination, (43) 670; (48) 870.
- determination in *Pediculus vestimenti*, (43) 160.
- determination in Rotifers, (49) 567.
- determination in sheep, (48) 566.
- determination mechanism, treatise, (50) 530.
- determination, theory, (50) 731.
- factors determining, (50) 825.
- forms, distribution in phanerogamic flora, (50) 431.
- glands as affected by vitamin B, (49) 562.
- in birds, studies, (42) 466.
- in farm animals, control, (49) 864.
- in plants, reversal, (48) 127.
- in young chicks, distinguishing, (49) Conn.Storrs 776.
- inheritance in plants, (44) 218, 219, 220.
- intergradation in plants, (44) 219, 220.
- linkage in silkworm, (43) 764.
- linked inheritance, application, (49) 165.
- neutralization from orchilytic serum injection, (46) 266.
- origin of variations in, (47) 172.
- ratio as affected by alcohol, (41) 864.

Sex—Continued.

- ratio as affected by breeding and selection, (41) 866.
 - ratio as affected by restricted diet, (49) 767.
 - ratios, factors affecting displacement, (47) 821.
 - ratios in *Drosophila*, (50) 530.
 - reversal and intersexuality, (50) 825.
 - reversal in fowls, (50) 530.
 - rôle in creatinuria of man, (46) 757.
 - Sexograph, value as indicator of sex of poultry eggs, (47) 577.
- Sexual—
- activity, excessive, in rabbits, (42) 467.
 - cycle as affected by corpus luteum, (41) 175.
 - cycle, mechanism, (50) 635, 826.
- Shaddock as budding stock, (41) 447.
- Shaft, overhung eccentrically loaded, whirling of, (49) 589.
- Shafts, stresses, analysis, (44) 484.
- Shales, distribution in Appalachian Mountains, (46) 487.
- Shallu, protein content, (41) Ariz. 367.
- Shallu, yields, (41) Mo. 637.
- Shark liver oils, higher alcohols from, (47) 311.
- Shark meat, utilization, (42) 659.
- Shavings, insulating value, (44) 588.
- Shea nuts, culture and expression of oil, (43) 240.
- Shearing machines, tests, (49) 486.
- Sheds, plans, (42) 285.
- Sheep—*see also* Ewes, Lambs, *etc.*
- alfalfa pasture for, (45) U.S.D.A. 575.
 - as affected by arsenic, (44) 77.
 - barn, description, (49) 899.
 - blood, nature of sugar in, (49) 715.
 - blowfly, control, (41) 852.
 - blowfly in South Africa, (49) 156.
 - blowfly prevention, (44) 854.
 - blowfly, remedies, (43) 258.
 - botfly, human infection from, (50) 259.
 - botfly, notes, (47) 883.
 - breeding, (47) Calif. 669, Okla. 867; (48) Calif. 571; (50) Can. 371.
- breeding—
- and feeding, (44) 571.
 - decline in England, (44) 571.
 - experiments, (42) 66; (44) Pa. 72, 177, Pa. 770, 869; (46) 270; (47) N.H. 473, Pa. 473; (48) 169, 868; (49) N.H. 370.
 - factors affecting, (43) N.H. 172.
 - for export, (49) 168.
 - for wool quality, (44) 868; (45) 376.
 - in Australia and New Zealand, treatise, (44) 268.
 - in Catalonia, (47) 866.
 - in Germany, (44) 72, 869.
 - in India, (47) 669; (48) 270.
 - in North Africa, (42) 560.

Sheep—Continued.

- breeding—continued.
 - management, and feeding, (50) 369.
 - pedigree, cost in England, (43) 571; (45) 376.
 - problems, (43) 570; (44) 869.
- breeds and crosses, development, (47) 866.
- breeds in Porto Rico, (47) 173.
- British breeds, (44) 364.
- broomcorn seed for, (43) 671.
- Bündner-Oberländer, history and characteristics, (49) 370.
- care and management, (48) 693.
- care in health and disease, (49) 377.
- care of flock at lambing time, (43) Wash. 197.
- cells, studies, (48) 566.
- Charmoise, history, (47) 375.
- cleansing of stomach worms, (49) N.C. 787.
- Columbia strain, (42) 869.
- composition, formulas, (48) 167.
- Corriedale, adaptability for southwestern Texas, (49) Tex. 467.
- Corsican breed, production, (49) 168.
- crosses, effect on wool, (48) 372.
- cycles of production, (44) N.J. 364.
- digestion experiments, (41) Mass. 277; (45) 168, 673; (46) 67, Mass. 476, 871; (47) 271, Mass. 273, 371, Tex. 472.
- digestive tract, (41) 81.
- dip, oxidation of polysulphid during use, (47) 587.
- dipping, (42) Mich. 694.
- dipping, risk from carbolic dips, (44) 377.
- dips, comparison, (42) 174.
- dips, effect on wool, (43) Wyo. 172.
- dips, phenols in, determination, (45) 316.
- disease, new, in Brazil, (41) 86.
- diseases, (41) 797; (42) Calif. 883.
- diseases—
 - affecting reproduction, (43) 683.
 - and parasites, (43) 673.
 - in Colorado, (41) 286.
 - in New York, (47) 80.
 - of genital organs, (43) 683.
 - summary, (44) U.S.D.A. 880.
 - textbook, (47) 883.
 - treatise, (44) 582.
- distribution in Australia, (48) 597.
- distribution in South America, (46) 269.
- dried yeast for, (44) 867.
- earless, breeding, (47) N.H. 175.
- edible tissues, vitamin B in, (49) U.S.D.A. 63.
- Egyptian clover for, (44) 567.
- elevator screenings for, (43) Can. 868.
- facial sinuses, (41) 81.
- farm, initial capital required, (43) 94.
- farming, costs and profits in, (45) Ohio 170.

Sheep—Continued.

- farming in New Zealand, (49) 670.
- feeding, (45) Wyo. 471.
- feeding—
 - by method of feeding equivalents, (49) 269.
 - during drought, (46) 72.
 - during shortage of grazing, (45) 376.
 - experiments, (42) U.S.D.A. 370, Calif. 868; (43) Ind. 375, Pa. 570; (44) U.S.D.A. 177, Ind. 365; (45) Okla. 376, Can. 874; (46) 67, 68, Ind. 477, U.S.D.A. 531; (47) Okla. 171, U.S.D.A. 171, 274; (48) Ind. 268, Kans. 268, 375, 570, 766; (49) Iowa 773; (50) Ind. 369.
 - in Australia, (43) 376.
 - rack, design, (43) 91.
- fleeces, variation and correlation in, (45) Wyo. 471.
- folds, design and construction in France, (42) 590.
- folds, plans, (42) 285.
- for western Washington, (46) Wash. 498.
- gid parasite affecting, (44) 184.
- grazing experiment, (48) 122.
- growth curves, (50) Mo. 467.
- growth estimation, (43) 371.
- growth studies, (46) 672.
- hair structure, (44) 467.
- handling on ranges, (48) Nev. 171.
- heat production, (45) 490.
- Herdwick, characteristics, (47) 275.
- horn transmission, (49) Idaho 268.
- hydrolyzed straw for, digestibility, (43) 569.
- improving in France, (47) 571.
- in Egypt, (42) 66.
- in Rocky Mountains, losses, (46) 883.
- in Tunis, (44) 267.
- industry in Canada, (41) 472.
- industry in South Africa, (41) 772.
- industry, injury from sheep-killing dogs, (47) U.S.D.A. 775.
- infestation of skin by grass seed, (43) 184.
- inheritance—
 - of characters, (42) Okla. 372; (44) N.H. 71; (46) 271; (47) 867.
 - of ear length in, (45) 170
 - of fertility, (41) 268.
 - of size and conformation, (50) N.H. 26.
- injury by squirrel-tail grass, (41) Nev. 782.
- insect pests, (45) 552.
- international trade, (46) 675.
- investigations, (46) 766.
- judging, (44) 494.
- judging by score card, (45) U.S.D.A. 775.
- judging of fleeces and wool, (44) 869.
- judging, treatise, (43) 697.

Sheep—Continued.

Karakul—

- breeding in Bokhara, treatise, (46) 270.
- breeding in Canada, (43) 69.
- breeding results, (47) 670; (48) 368.
- breeding tests, (48) 664.
- origin and management, (46) 766.
- ked, transmission of trypanosomes by, (50) 357.
- lactating, calcium balance experiments, (46) 74.
- Leicester, description, (47) 72.
- length of life, (44) 866.
- lick-troughs for, (42) 187.
- lungworms in, Okla. (43) 79; (47) 883.
- maggot flies and parasites, (46) 661; (48) 255.
- maggot flies, notes, (41) 86; (47) 361, 658.
- managing in Union of South Africa, (49) 168.
- manure, composition, (49) 121.
- manure, fertilizing value, (49) Ohio 725.
- manure, nitrification, studies, (46) 714.
- Merino and Leicester, wool fibers, (48) 767.
- Merino, breeding in Germany, (45) 69.
- Merino, history and breeding, (42) 770.
- mineral supplements for, (44) Ohio 175.
- multinippled and twin bearing, breeding, (50) 331.
- muscle, diamino acid content, (47) 610.
- muscle parasite of, (43) Wyo. 786.
- nematode parasites of, (46) 685.
- number in New Zealand, (49) 168.
- on irrigated farms, (41) U.S.D.A. 568.
- Oxford Down, status of breed, (45) 470.
- parasite, free-living larval stages, (50) 253.
- parasites, (45) Tex. 483; (47) Ohio 453, 483; (48) Ohio 193; (49) La. 283.
- parasites and diseases, U.S.D.A. (44) 582; (49) 786.
- pasture plants for, palatability, (44) 670.
- pasturing experiments, U.S.D.A. (43) 465; (44) 770.
- pasturing on irrigation ditches, (48) U.S.D.A. 270.
- pea straw for, (43) Wash. 772.
- place on western Washington farms, (50) West.Wash. 171.
- plants poisonous to, (47) Nev. 786.
- poisoning—*see also* Plants, poisonous.
 - by arrow grass, (43) Nev. 77.
 - by *Astragalus tetrapterus*, (43) U.S.D.A. 78.
 - by "coffee bean," (42) U.S.D.A. 879; (44) 678.

Sheep—Continued.

poisoning—continued.

- by death camas, Nev. (41) 281; (45) 782.
- by greasewood, (50) U.S.D.A. 77.
- by lupine, (43) Wyo. 783.
- by milkweed, (44) Nev. 875.
- by rhododendron, (47) 878.
- by various plants, (47) Nev. 786.
- by whorled milkweed, (43) U.S.D.A. 470.
- by woody aster, (43) Wyo. 782.
- by yerba manza, (44) 180.
- of meat by paratyphoid infection, (42) 273.
- potatoes for, (41) Me. 142.
- pox and anthrax, vaccination, (44) 582.
- pox and cowpox, relationship, (47) 285.
- pox, immunization, (43) 685; (49) 480.
- pox, studies, (49) 181.
- pox vaccine, preparation and use, (48) 583.
- project study outlines, (44) 596.
- Raisers' Guild, Castilian, history, (46) 390.
- raising—
 - for wool in Africa, (44) 365.
 - in Argentina, (47) 375.
 - in Chile, (49) 168.
 - in China, (43) 171.
 - in England, (47) 866.
 - in England, decline, (43) 571.
 - in England, survey of growth, (49) 191.
 - in Georgia, (48) 474.
 - in Germany, (44) 72.
 - in India, (43) 269.
 - in New South Wales, (45) 875.
 - in North Dakota, (43) 673.
 - in Montana, (48) Mont. 475.
 - in twelfth Federal reserve district, (48) 571.
 - on temporary pastures, (44) U.S. D.A. 869.
 - treatise, (41) 97; (48) 474.
- range—
 - breeding experiments, (42) 869.
 - emergency feeding, (41) Nev. 271.
 - factors affecting wool, (47) Wyo. 867.
 - management, (41) U.S.D.A. 565; (42) 868.
- sarcosporidial cysts in, (44) 79.
- scab—
 - control (43) 272; (47) 587; (49) 179.
 - dips and dipping, (42) 174.
 - eradication, (43) U.S.D.A. 471.
 - in Canada, (47) 181.
 - in Great Britain, (50) 182.
 - notes, (41) 873; (44) 180; (46) 773; (49) 278; (50) 582.
 - shearing, early v. late, (50) Can. 469.

Sheep—Continued.

- shearing, machine v. hand, (42) 869.
 - shearing twice a year, effect, (49) Tex. 467.
 - Shropshire, fertility in, (46) 368.
 - slaughtering, directions, (44) U.S.D.A. 471.
 - stock cooperative credit society, rules, (46) 592.
 - stomach worms in, (42) U.S.D.A. 381; (43) Okla. 79, 278, 384; (45) 182, Okla. 478, Can. 887; (46) 685, 883; (47) Okla. 85; (48) 398, 882.
 - Suffolk, history and management, (46) 766.
 - Suffolk, raising in Scotland, (45) 471.
 - sunflower silage for, (45) 169, Wash. 269, Wash. 471.
 - sweet clover seed screenings for, (43) U.S.D.A. 464.
 - tansy as bee forage, (44) Calif. 731.
 - teeth, incrustations on, (45) 875.
 - thyroidectomized, calcium content of blood, (49) 765.
 - tick, life history notes, (43) 883.
 - tick, transmission of trypanosomes by, (50) 357.
 - transformation of alveolar epithellum, (43) 384.
 - trypanosome, studies, (50) 357.
 - vaccination, review of literature, (45) 385.
 - weight loss during transportation, (43) 672.
 - wild and domestic, (44) 869.
 - winter management, (42) 899.
 - winter ration, wheat straw in, (45) Kans. 267.
 - wool quality, factors affecting, (44) 869.
 - wool yields, (50) Can. 469.
 - worms, measurement of eggs, (46) 777.
 - zinc in muscle tissue, (47) 564.
- Sheepfolds, design in France, (45) 591.
- Sheep's burnet, characteristics and uses, (48) 435.
- Sheepskins—
- exports from South Africa, (41) 772.
 - handling, need for improved methods, (43) 70.
 - trade in India, (44) 573.
- Shell fish, drying, (41) 807.
- Shellac production, (45) 861.
- Shelter belts, cooperative, (41) U.S.D.A. 840.
- Shelter belts, notes, (41) N.Dak. 837.
- Shepherd's purse, crossing experiments, (41) 134; (43) 434.
- Sherbets, preparation in the home, (42) 255.
- Shingle nail experiments, (50) Pa. 485.
- Shingles—
- durability, (50) Pa. 485.
 - preservation, (47) Pa. 488.
 - production in 1918, (43) U.S.D.A. 150.
- Shipping fever, *see* Influenza, equine.

- Shoddy, fertilizing value, (41) 218; (44) 513.
- Shoe leathers, wearing qualities, (49) U.S. D.A. 717.
- Shoq plant, value in wheat and barley culture, (44) 232.
- Shore water as affected by off-shore winds, (43) U.S.D.A. 719.
- Shorea robusta, *see* Sal.
- Short-circuit beetle, biology and control, (48) U.S.D.A. 555.
- Shortening action, relation to surface phenomena, (49) 455.
- Shortening, definition and measurement, (46) 258.
- Shorts—
- analyses, (41) N.H. 68, R.I. 564, 868; (42) 769, Tex. 769, Mass. 866; (43) Ky. 373, Ind. 867; (44) 267; (45) Tex. 68; (46) Can. 167, Mich. 168.
 - analyses and digestibility, (45) 468.
 - and red dog, analyses, (44) Mass. 671.
 - as supplement to alfalfa pasture, (42) U.S.D.A. 374.
 - detection of adulteration, (47) 408, 409.
 - standard fiber content, (47) 70.
 - standards for, (49) 65.
 - with screenings, analyses, Mich. (42) 63; (44) 568.
- Shot-hole borer—
- affecting tea, (44) 851, 855; (50) 57.
 - control, (41) 359, 463.
 - notes, (44) Oreg. 850; (45) 550.
 - susceptibility of woods and treatment, (46) 252.
- Shot-hole fungus, injury by, (42) 846.
- Shrew from Warren Island, (41) Alaska 353.
- Shrews, unrecognized, from California, (46) 456.
- Shrimp meal, analyses, (43) 868.
- Shrimp scrap, analyses, (45) Tex. 68.
- Shrimps, vitamin A in, (47) 662.
- Shrubs—
- broad-leaved evergreen, for the South, (46) 843.
 - bud variations in, (46) 721.
 - culture, (43) U.S.D.A. 339, Nebr. 644.
 - culture in California, (49) 438.
 - demonstration plantings, notes, (42) N.Dak. 738.
 - flowering, treatise, (49) 835.
 - food reserve in, (48) 625.
 - for Alaska, (44) Alaska 336.
 - for Nebraska, list, (43) 240.
 - for Iowa, (43) 742.
 - for Minnesota, Minn. (42) 736, 834.
 - for Missouri, (44) 45.
 - for Wisconsin, (41) 242, 835.
 - germination tests, (42) 541.
 - hardy, in British Isles, (48) 736.
 - killing point, variation, (50) Minn. 126.
 - native, list, (45) W.Va. 240.
 - new, near Washington, D. C., (43) 222.

Shrubs—Continued.

- of Europe, guide, (44) 238.
- of Mexico, (44) 40; (48) 43.
- ornamental, from China, (41) 448.
- ornamental, hardy, new in cultivation, (41) 448.
- ornamental, in homestead development. (49) Ohio 293.
- ornamental, in South Africa, (43) 441.
- ornamental, new and rare, (42) 641.
- ornamental, tests, (43) U.S.D.A., 339.
- ornamental, winter injury, (41) Ariz. 343; (43) 753.
- ornamental, winter injury in Canada, (41) 448.
- planting, (44) Minn. 336.
- shade and ornamental, tests, (45) N. Dak. 239.
- wild, culture, (50) 240.
- Side-bone, treatment by shoeing, (45) 382.
- Sidemia devastator, notes, (45) 759.
- Sidewalks, concrete, construction, (43) 90.
- Siebercitta, status of, (41) 250.
- Siga incertellus, control, (49) 556.
- Sikorsky sedimentation apparatus, (50) 14.
- Silage—*see also* Alfalfa, Clover, *etc.*
 - acid-forming organisms, (41) 614.
 - acids determination in, (49) 205, 206.
 - acids of, effect on pigs, (41) Iowa 273.
 - alfalfa—
 - analyses, (42) 560.
 - black, analyses, (41) Kans. 35.
 - composition and nutritive value, (46) 269.
 - Italian method of ensiling, (50) 468.
 - preparation, (41) N.Dak. 140.
 - studies, (46) Mich. 412.
 - analyses, (47) Conn.State 570; (50) Oreg. 7.
 - and alfalfa, feeding value, (50) Ohio 170.
 - and cottonseed meal, feeding value, (46) Tenn. 169.
 - and silos in Ontario, (47) 489.
 - apple pomace, analyses and manufacture, (49) U.S.D.A. 675.
 - as hay substitute, (46) 372.
 - bacteriology of, (43) Pa. 569.
 - barley and pea, feeding value, (46) Oreg. 170.
 - barley, yields in Australia, (46) 132.
 - beet-top, analyses, (44) 768.
 - broom corn, composition, (47) Okla. 171.
 - cane, feeding value, (44) Kans. 769; (47) Okla. 70.
 - clover and rye grass, analyses, (42) 560.
 - clover and timothy, analyses, (47) Minn. 130.
 - clover v. sunflower for milk production, (50) Can. 375.
 - comparison of kinds, (46) 878.
 - composition, (45) Mich. 671; (48) Can. 368.

Silage—Continued.

- composition and feeding value, (45) 374; (46) 269; (49) 166; (50) 866.
- corn—
 - analyses, (42) 560; (44) Wash. 471, Ariz. 568, Pa. 769; (45) Iowa 776; (46) Oreg. 170; (47) Ohio 171; (49) N.H. 329.
 - and cottonseed meal for beef production, (47) 278.
 - and soy bean, feeding value, (41) Ind. 68; (47) Ark. 772; (49) Pa. 472.
 - and sunflower, feeding value, (48) 398.
 - as affected by silo material, (44) 568.
 - composition and nutritive value, (46) 269.
 - cost of production, (44) N.Dak. 190; (47) 278.
 - cut at different stages, (41) S.Dak. 567.
 - feeding experiments, (42) Nebr. 169.
 - feeding value, (44) Kans. 769, Pa. 769; (47) Okla. 70, Pa. 471; (49) Nebr. 671, N.C. 773, 869.
 - for fattening cattle, (44) S.Dak. 365.
 - for horses, (43) Ariz. 775.
 - for lambs, (42) Calif. 868.
 - for steers, (43) Ind. 375.
 - for winter feeding of steers, (42) 561.
 - from late and early varieties. Ohio (47) 480; (50) 175, 463.
 - from shock and ear, (43) Mo. 770.
 - irrigation experiments, (41) Nebr. 433.
 - losses and exchanges of material during storage, (50) Ohio 572.
 - nitrogen and other losses, (45) U.S.D.A. 266.
 - preservation, studies, (43) Pa. 569.
 - relation of age to yield, (45) Idaho 222.
 - ripening, rôle of bacteria in, (45) 169.
 - rôle of lactic acid bacteria, (45) 502.
 - rôle of pentose-fermenting bacteria in, (42) 502, 709.
 - seed selection, (41) N.J. 35.
 - smutted, feeding value, (48) S.Dak. 70.
 - stage of maturity studies, Pa. (49) 274; (50) 474.
 - starch in as affected by fermentation, (43) 501.
 - stover, investigations, (44) 768.
 - stover v. corn, (48) Mich. 268.
 - stover v. corn for milk production, (45) 174; (47) 279.

Silage—Continued.

corn—continued.

- studies, (46) Mo. 372, Mich. 412; (48) N.Dak. 265.
- types, feeding value, (46) Kans. 367.
- v. oat and vetch, (48) Oreg. 576.
- v. sorghum, (42) Kans. 371; (46) Ky. 71; (50) S.C. 679.
- v. sunflower, (43) Nebr. 677; (44) W.Va. 369; (45) U.S.D.A. 530; (46) N.Mex. 169, 372; (47) Pa. 478, Pa. 581; (49) N.Dak. 78, 398, Calif. 576, Wyo. 768; (49) Wis. 670, U.S.D.A. 824; (50) Can. 432.
- v. sunflower for beef production, (49) Wash.Col. 268.
- v. sunflower for milk production, (45) Wash. 275; (49) Idaho 778; (50) Mont. 176, Can. 375.
- variety tests, (41) N.Dak. 139.
- cost of cutting, (49) Mont. 184.
- cost of production, (50) Can. 592.
- crimson clover, analyses, (42) 560.
- crops—
 - analysis, (45) 506.
 - comparison, (49) Can. 734.
 - cost of production, (41) Minn. 91.
 - culture experiments, (41) Mich. 636; (42) Wash. 828; (44) 632; (47) Alaska 527; (49) 525.
 - for summer and winter feeding, (47) West.Wash. 433.
 - machinery for cultivating, (43) 289.
 - production, (49) West.Wash. 395.
 - seeding experiments, (49) Can. 734.
 - varieties in Canada, (41) 732.
 - variety tests, (41) Kans. 34, Tex. 36, Nev. 227, Mich. 636; (45) Idaho 223.
 - yields, (41) N.J. 35; (43) Ariz. 733.
- cutters, tests, (45) 393; (50) 687.
- cutting, (41) 488.
- darso, analyses, (44) Ariz. 568.
- darso, feeding value, Okla. (47) 70, 71; (49) 467.
- feeding, effect on pregnant ewes, (47) Wyo. 171.
- feeding value, (41) Mo. 78, 368, Can. 567; (46) Oreg. 170, Kans. 478; (47) 77.
- fermentations in, (45) 714.
- feterita, analyses, (44) Ariz. 568.
- flavor of milk, (48) U.S.D.A. 79.
- for beef production, (47) Okla. 70.
- for dairy calves, (41) Conn.Storrs 871.
- for dairy cows, (41) Ariz. 371.
- for lambs, (41) Ind. 70, Kans. 71, Nebr. 770, 771.
- for milk production, (48) 77.
- for range cattle, (41) Ariz. 368.

Silage—Continued.

- for summer feeding, (44) Mich. 195.
- formation, destruction of pentosans in, (45) 502.
- formation, losses in, (49) 464.
- from *Elodea canadensis*, (41) 737.
- from grape shoots, (41) 618.
- from mustard, vetch, and oat straw, analyses, (42) 560.
- from native grasses, (41) Alaska 30.
- from various crops, (41) Mo. 334.
- from vetch, oats, rye, and wheat, analyses, (42) 560.
- from wheat, barley, and oats, (43) 527.
- from wild sunflowers, (43) 677; (46) Kans. 478.
- inoculation, (42) Mich. 397; (44) 175, Mich. 175.
- juice, disposal, methods, (42) 591.
- kafir, feeding value, Okla. (47) 70, 71.
- losses from decomposition, (49) Wis. 669.
- making and use in British Isles, (42) 560.
- making in Argentina, treatise, (46) 269.
- making in Canada, (49) 890.
- making, use of lactic acid bacteria, (45) 476.
- mannitol-producing organisms in, (46) 804.
- maximum utilization, (47) 75.
- maximum utilization for baby beef, (50) Kans. 65.
- meadow hay, analyses, (42) 560.
- microorganisms in, effects, (50) Minn. 175.
- millet, analyses, (47) Minn. 130.
- millet, feeding value, (49) 869.
- moldy, effect on cattle, (47) Minn. 380.
- nature of pigment in, (50) 268.
- oat and pea—
 - analyses, (47) Minn. 130.
 - feeding value, (48) 876; (49) Pa. 274, Wyo. 467, Pa. 472, Wyo. 867.
 - palatability tests, (45) 375.
 - v. sunflower, (47) Mich. 176, Wyo. 572.
- oat and tare, changes in, (49) 264.
- oat and tare, digestibility, (46) 871.
- oat and vetch, analyses, (42) 560.
- oat and vetch v. corn or sunflowers, (48) Oreg. 576.
- oat, composition and nutritive value, (46) 269.
- oat, pea, and vetch, (41) 676.
- packer test, (47) Iowa 792.
- pathogenic bacillus from, (41) 280.
- pea and barley, feeding value, (46) Oreg. 170.
- poisoning in horses, (49) Wis. 684.
- potato, analyses, (47) Minn. 130.
- produced in barrels, quality, (45) 374; (46) 871.

Silage—Continued.

- production, (45) Miss. 37.
- production, bacteriology of, (44) Wis. 266.
- quality, factors affecting, (49) 264.
- ration, unlimited, for cattle, (47) 278.
- red clover, composition and feeding value, (49) Pa. 472.
- Russian thistle, analyses, (48) N.Dak. 69.
- Russian thistle, feeding value, (41) N.Mex. 176.
- sorghum, analyses, (44) Ariz. 568; (47) Minn. 130.
- sorghum and hegari, analyses, (44) Ariz. 568.
- sorghum, feeding value, (41) 367; (44) Tex. 868.
- sorghum, for lambs, (42) Calif. 868.
- sorghum, for range cattle, (41) Ariz. 368.
- sorghum, for winter feeding of steers, (42) 561.
- sorghum v. corn, *see* Silage, corn v. sorghum.
- soy bean and corn, *see* Silage, corn and soy bean.
- soy bean, studies, (41) Ind. 68, Mo. 334.
- studies, (44) Oreg. 866.
- Sudan grass, composition, (43) Okla. 68.
- sunflower—
 - acid content, (42) 469.
 - analyses, (46) Can. 269, N.H. 367; (47) Minn. 130, Ohio 171.
 - as poultry feed, (43) Minn. 674.
 - composition, (43) Mont. 69; (50) 267.
 - composition and digestibility, (43) Mont. 770.
 - digestion experiment, (45) 169.
 - effect of stage of maturity, (49) Ill. 375.
 - feeding value, (41) Nev. 227; (43) Mont. 68, Mich. 677; (46) Oreg. 170, N.Mex. 173, N.H. 367, Wyo. 676, U.S.D.A. 725; (47) Okla. 70, Okla. 71, U.S.D.A. 171, Pa. 580, Colo. 674; (48) S.Dak. 70; (49) Mont. 172, Okla. 467, Wyo. 467, Wyo. 867, 869; (50) Can. 371.
 - fermentation tests, (44) Nev. 171.
 - for dairy cows, (44) 370.
 - for milk production, (49) Ga. 578.
 - palatability in relation to time of cutting, (47) Wis. 431.
 - quality in, (46) Mont. 269.
 - studies, (48) N.Dak. 265; (49) Mont. 166.
 - v. clover, for milk production, (50) Can. 375.
 - v. corn, *see* Silage, corn v. sunflower.
 - v. oat and vetch, (48) Oreg. 576.

Silage—Continued.

- sunflower—continued.
 - v. pea and oat, (47) Mich. 176.
 - v. sorghum, feeding value, (46) N.Mex. 169.
 - v. turnips for steers, (50) Can. 468.
- sweet clover—
 - analyses, (49) 771.
 - and oat straw, feeding value, (49) 869.
 - feeding value, (49) 375.
 - microbiology, (49) 464.
 - notes, (49) 231.
 - preparation, (41) N.Dak. 140.
- thistle, tests, (48) N.Dak. 265.
- timothy and clover, analyses, (47) Minn. 130.
- use of weeds for, (41) Colo. 646.
- utilization by cattle, (44) Kans. 769.
- v. hay, feeding value, (47) Pa. 478.
- v. soiling crops, feeding value, (47) Iowa 78.
- weights of, (41) Mo. 691, Mo. 692; (42) Kans. 187.

Silica—

- crucibles, use, (46) 805.
- effect on chemical reactions in soil, (41) 720.
- effect on composition and growth of plants, (48) 722.
- relative solubility on acid and alkaline soils, (43) Mich. 125.

Silicate—

- colloids as affected by alum, (47) 221.
- rocks, use as potassic fertilizers, (49) 817.

Silicates—

- effect on plant growth, (47) Ohio 423.
- effect on wheat, (46) 717; (50) 820.
- potassium determination in, (48) 710.

Silicic acid determination, (43) 202.

Silicic acid, yield-increasing action, (50) 425.

Silicon chlorid, effect on soil permeability, (47) 20.

Silk cotton wood, durability tests, (43) 44.

Silk—

- from British East Africa, (46) 558
- growth, manufacture, and properties, (44) 393.
- industry and labor in Japan, (46) 246.
- industry in India, (46) 834.
- moths, wild, exhibition, (45) 657.
- properties and uses, (50) 534.
- rôle in economic progress and international trade, (49) 94.
- substitutes in Germany, (43) 204.

Silkworm—*see also* Sericulture.

- eggs, distribution, (47) 254.
- eggs, segmentation, (44) 756.
- nurseries, planning, (47) 391.

Silkworms—

- culture, handbook, (47) 851.
- diseases, (44) 353.
- diseases and treatment, (50) 582.

Silkworms—Continued.

- diseases in India, (49) 154.
- effect of nicotin sulphate on, (45) U.S.D.A. 151.
- improvement, (45) 657.
- inheritance of egg color in, (50) 531.
- inheritance of translucence, (48) 764.
- injury by brown-tail moth caterpillars, (42) 852.
- metamorphosis of alimentary canal, (45) 758.
- metamorphosis of salivary glands, (44) 59.
- notes, (45) 359.
- physiology, (46) 53.
- pseudograsserie, (41) 358.
- toxicity of arsenic to, (49) U.S.D.A. 449.
- Silky oaks, timbers, studies, (42) 348.
- Silo wall construction, effect on freezing of silage, (41) Iowa 291.
- Silo walls, making impervious, (49) Iowa 788.
- Silos—
 - and silage in Ontario, (47) 489.
 - capacity, estimating, (41) Mo. 691, Mo. 692; (42) Kans. 187; (44) Mich. 588.
 - concrete, construction, (43) 90.
 - concrete stave, tests, (44) 568, 689.
 - construction, (41) 488, Ark. 587, Iowa 691; (42) 187, 285, 286, 390; (43) 485.
 - construction in Canada, (49) 890.
 - construction in Cuba, (42) 390.
 - construction, wood in, (46) Mich. 598.
 - experimental, studies, (45) 374.
 - filling, (41) 488; (47) Kans. 865.
 - for Alberta, plans, (46) 289.
 - pit, construction, (47) Ariz. 891; (50) Colo. 388, 774.
 - pit, design, (47) Ariz. 891.
 - pit, semipit, and bank, construction, (49) 792.
 - pit, use in dairying, (43) Kans. 576.
 - reinforced concrete, construction, (46) 891.
 - stave, erection, cost accounting in, (49) 890.
 - trench, description, (47) 392.
 - types, (43) Mich. 691.
 - types as affecting quality of silage, (43) Pa. 569.
 - wood preservatives for, (42) Calif. 894.
- Silpha atrata, meaning, (47) 551.
- Silt—
 - behind old and new Austin dams, (50) 286.
 - content of Deli River, (42) 421.
 - content of river waters of Java, analyses, (42) 421.
- Silvanus surinamensis—
 - control, (47) Calif. 654.
 - notes, (41) 759.
 - on dried fruit, (43) 255.
- Silver, bactericidal action, (45) 74.

- Silver fir tests at Avondale, (49) 744.
- Silver fish, habits and control, (46) Mich. 558.
- Silver leaf—
 - disease, (42) 150, 645, 845; (43) 346; (46) 451, 551; (49) 845.
 - disease in South Africa, (50) 353.
 - false, description, (42) 150.
- Silver preparations, therapeutic, (41) 781.
- Silver "Y" moth, notes, (48) 152.
- Silvery lupine, poisonous to livestock, (45) Wyo. 479.
- Silvius notatus, bionomics of, (46) 248.
- Simodactylus cinnamomeus on sugar cane, (43) 52.
- Simulia, paper on, (48) 252.
- Simulidae, studies, (43) 51; (44) 759; (47) 551.
- Simulium columbaczense, devastation by, (50) 156.
- Sincama, culture directions, (45) 35.
- Singing, increase in metabolism during, (42) 167.
- Sipha flava, notes, (44) 159; (45) 453.
- Siphocoryne avenae, *see* Grain aphid, European.
- Siphona geniculata, life history, (44) 354.
- Siphonaptera of Switzerland, catalogue, (45) 661.
- Sires—*see also* Bulls.
 - dairy herd, (46) Wash. 297.
 - effect on litter size, (41) 268.
 - Gold Medal, comparative talent, (49) 677.
 - Gold Medal Jersey, comparison, (49) 374.
 - great, effect on breed, (48) 399; (49) 878.
 - Guernsey, performance, (47) 278.
 - Guernsey, production records of daughters, (45) 777.
 - Hereford, classification, (49) 865.
- Holstein-Friesian—
 - records, (47) 279; (48) 175.
 - relative values, (46) Me. 174.
 - transmitting qualities, (47) Me. 176.
- Jersey, comparison, (50) Mo. 874.
- Jersey, selecting, (46) 273.
- pure, relation to elimination of mongrel blood, (42) 767, 821.
- purebred, for livestock improvement, (42) U.S.D.A. 867; (43) U.S.D.A. 464; (45) 375.
- purebred, value, (47) 279, Iowa 782; (48) S.Dak. 78, U.S.D.A. 266.
- purebred, value on scrub and grade cows, (49) Iowa 779.
- ratio to dams, U.S.D.A. (43) 770; (45) 733.
- Register of Merit Jersey, compared, (49) 878.
- studies, (47) 278.
- Sirup—*see also specific kinds.*
 - from apples, recipe, (43) 808.
 - from sugar beets, (41) 117; (42) 507.

Sirup—Continued.

- from sugar beets, recipe, (43) 808.
- making in the home, (42) 255.
- manufacture, clarifying sugar cane juices for, (44) U.S.D.A. 206.
- manufacture from sorghum, Wis. (43) 335; (44) 225.
- manufacture in Philippines, (44) 807.
- maple, manufacture in Michigan, (42) Mich. 397.
- production from sweet potatoes, (49) U.S.D.A. 506.
- sorghum, manufacture, (42) Minn. 7.
- sugarhouse, precipitate formed in, (48) 415.

Sirups—

- cane, composition and calorific value, (41) 507.
- chemistry of, progress, (48) 712.
- dry substances in, (46) 507.
- inspection and analysis, (45) Conn. State 365.
- soda fountain, ingredients, (47) 611.
- solids in, determination, (50) 202.

Sisal—

- analyses, (43) 829.
- binder twine, used, recovery, (45) 637.
- breeding experiments, (49) 735.
- culture and uses, (43) 826.
- culture experiments, (45) 34.
- culture in Philippines, (44) U.S.D.A. 528.
- determination of flexibility, (46) 230.
- fungus diseases, (47) 44.
- grading, baling, and inspection, (50) 434.
- hail damage, (47) 839.
- hemp as binder-twine fiber, (41) U.S. D.A. 639.
- hemp, culture experiments, (41) Hawaii 138.
- hemp, production in Yucatan, (41) 829.
- improvement, (47) 827.
- in Rhodesia, summary, (45) 535.
- industry in Antigua, (46) 226.
- pests affecting, (50) 256.
- production in French Africa, (42) 230.
- properties and uses, (50) 534.
- ring spot disease, (47) 348.
- stump, analyses, (44) Hawaii 71.
- weevil injury, (47) 761.

Sitones—

- hispidulus, notes, (42) 743; (49) Ind. 548.
- lineatus, bionomics of, (45) 363.
- lineatus, habits, (47) 259.
- spp., bionomics, (48) 57.

Sitophilus—

- linearis, studies, (44) 657.
- oryza, parasite of, (49) 256.
- oryza, studies, (44) 659.

Sitotroga cerealella, *see* Angoumois grain moth.

Size factors—

- and size inheritance, (50) 823.
- of animal body, nature, (41) 473.

Skatol—

- effect on nitrogen excretion of rabbit, (48) 766.
- formation during decomposition of salmon, (49) 802.

Skeletal development, studies, (41) 269.

Skeletal structure, laws of, (41) 269.

Skim milk—

- amino acid content, (41) 367.
- as milk substitute for calves, (44) 776.
- as protein supplement for pigs, (49) Mich. 469.
- as source of protein for egg production, (47) Idaho 870.
- corrected, for pigs, (44) 673.
- effect on blood regeneration, (44) 565.
- fat in, methods of determining, (43) N.Y.Cornell 415.
- feeding to chicks, effect on later egg production, (50) W.Va. 72.
- feeding value, (41) Mich. 74, 569; (44) Pa. 770; (49) Mont. 173, Ky. 574; (50) Wash.Col. 277.
- for calves, (43) U.S.D.A. 469; (50) 579.
- for pigs, (42) Calif. 871, Ohio 871; (44) Wis. 268.
- nutritive value, (41) Ill. 65, 670.
- optimum quantity for calves, (49) 676.
- powder, effect on weaning pigs, (46) 874.
- powder, feeding value, (49) 473.
- powder, vitamin B in, (46) 61.
- returns from chickens and pigs, (47) Miss. 73.
- rôle in nutrition of chicks, (43) Ky. 72.
- sour, as source of protein for hens, (49) Idaho 777.
- sour, for chicks, (43) N.C. 468.
- supplement for calf feeding, (44) 370.
- testing, (46) Calif. 578.
- utilization, (41) 80.
- v. beef scrap for egg production, (50) Can. 472.
- vitamin A in, (50) 59.

Skins—*see also* Hides.

- and hair, disinfecting, (46) 480.
- disinfection, (43) 180.
- preparation of, (43) U.S.D.A. 449.
- rabbit, preparing, (43) U.S.D.A. 378.
- small, home tanning, (49) U.S.D.A. 717.

Skunk, spotted Florida, notes, (42) 748.

Skunks—

- breeding, (47) 277; (48) 768.
- exhibition standards, (43) 575.
- nematode parasite of, (49) 499.
- new, (46) 655.

Sky, blue color of, (43) 618.

Sky radiation, observations, (43) U.S.D.A. 117.

Skylark, food habits, (41) 454.

Slabs, moments and stresses, (47) 887.

Slag, *see* Phosphatic slag.

Slag wool, thermal conductivity, (49) 186.

Slaughterhouse, municipal, at Alexandria, Egypt, (41) 279.
 Slaughterhouse refuse, value, (44) 725.
 Slaughterhouses, inspection in England and Wales, (47) 283.
 Slaughterhouses, model by-laws, (48) 480.
 Slaughtering methods, modern, (49) 772.
 Sleeping sickness, relation to tsetse fly, (45) 761.
 Sleeping sickness, treatment, (48) 677.
 Sleet and glaze, formation, (43) U.S.D.A. 119.
 Sleet and snow, effect on New York City traffic, (43) U.S.D.A. 120.
 "Slick spots," studies, (41) Idaho 18.
 Slime molds, North American, treatise, (50) 727.
 Slime molds of Ontario, (45) 144.
 Slope exposure studies, (49) 28.
 Sludge—*see also* Sewage.
 activated, fertilizing value, (47) 420, 520, 818; (49) 216.
 activated, fixation of atmospheric nitrogen by, (50) 323.
 activated, studies, (42) 188; (50) 190.
 by-products, (43) 520.
 fertilizing value, (41) 326, 627; (43) 189, 221.
 liquid, fertilizing value, (48) 123.
 nitrification experiments, (44) 24.
 Sludges v. sodium nitrate as fertilizers, (44) 24.
 Slugs—
 carnivorous, of South Africa, (42) 451.
 garden, notes, (41) Conn.State 159; (42) 52.
 injurious to vegetables, (45) V.I. 150.
 or "lapa" in Porto Rico, (47) 163.
 studies, (44) Oreg. 158.
 Small holdings—*see also* Land settlement and Land tenancy.
 in Montserrat, (41) 891.
 in Scotland, (41) 792; (43) 594.
 Smallpox, immunization, (47) 483.
 Smartweed borer, biology, (45) 154.
 Smelter by-products, fertilizer from, (41) 427.
 Smelter fumes as affecting plants, (41) 329, 427.
 Smicronyx sculpticollis, notes, (46) 661.
 Smith, G. A., biographical notes, (50) 698.
 Smoke—
 effect on plants, (44) 430; (46) 738; (47) 749.
 effect on soils, (44) 509.
 formations in air drainage, (43) U.S.D.A. 118.
 gas, injury to plants, (45) 425.
 injury from coke ovens, (44) 825.
 injury to trees, (46) 434, 738.
 injury to trees, indicator for, (47) 129.
 pollution, plant as index, (45) 821.
 products, effect on plants, (44) 825.

Smoke—Continued.
 screens, efficiency against frost, (50) U.S.D.A. 115.
 Smokehouse, tile, specifications, (42) Iowa 470.
 Smokehouses, plans, (47) 688.
 Smudging, value in frost protection, (44) U.S.D.A. 119; (48) N.Mex. 837.
 Smut—*see also* Cereal smut, Grain smut, and specific hosts.
 control, (44) 343; (46) 846; (47) 542.
 on Eleusine coracana, experiments, (50) 244.
 remedies, analyses, (41) Mich. 443.
 spore content, relation to attack in the field, (49) 839.
 spore germination, studies, (50) 245.
 stinking, control, (49) Mich. 841.
 stinking, notes, (47) 45, 542.
 Smuts, blossom infection by, (41) 346.
 Smuts, common, treatment, (49) Okla. 542.
 Smuts of Indiana, list, (43) 329.
 Smythurodes betae, identity, (41) 255.
 Snail, dangerous, introduced in California, (41) 548.
 Snail poison, (50) 553.
 Snails—
 African, in Ceylon, (44) 751.
 distribution, factors limiting, (50) 252.
 fresh-water, destruction, (44) 582.
 in Burma, (45) 657.
 trematodes of, in South Africa, (42) 678.
 white, affecting citrus, (50) 657.
 Snake bites, serotherapy, (41) 577.
 Snakeroot, white—
 feeding tests, (49) Ind. 580.
 poisonous to livestock, Ind. (49) 584; (50) 181.
 Snapdragon—
 damping-off, notes, (43) 658.
 leaf spot, control, (43) 658.
 Phyllosticta blight, studies, (45) 548.
 rust, control, (43) N.H. 44; (46) Mass. 653; (49) N.H. 351, N.H. 651.
 rust, germination of teliospores, (49) 243.
 rust, life history, (46) 844.
 rust, notes, (41) Ill. 752; (42) 541; (43) 841; (44) Pa. 746; (45) 541, 851.
 Septoria, (46) 654.
 wilt, cause, (49) 648.
 Snapdragons—
 as affected by artificial light, (47) Md. 235.
 culture, (49) Alaska 435.
 Sneezeweed, western, poisonous to livestock, (42) 879; (46) U.S.D.A. 82.
 Snow—
 analyses, (46) U.S.D.A. 116; (50) 716.

Snow—Continued.

- and sleet, effect on New York City traffic, (43) U.S.D.A. 120.
 - clinging qualities, (45) U.S.D.A. 17.
 - crystals, paper on, (43) U.S.D.A. 119.
 - effect on development of vegetation, (43) 509.
 - effect on vegetation in Pyrenees, (41) 328.
 - fertilizing value, (41) Can. 510; (43) Can. 728; (45) 426, Can. 818; (48) Can. 22.
 - layer measurements in California, (44) U.S.D.A. 416.
 - melting in Oregon and Washington, studies, (41) 785.
 - molding, control in coniferous nursery stock, (49) 755.
 - nitrogen, chlorin, and sulphates in, (41) 620.
 - nitrogen in, (48) 114.
 - removal work, plans, (44) U.S.D.A. 586.
 - substances dissolved in, (45) 618.
 - survey, apparatus and methods, (44) 314.
 - surveys, (41) Nev. 211; (42) 715.
- Snowdrop—
- bulbs, weevil infesting, (49) 357.
 - fungus, notes, (47) 548.
 - sap, inhibition of invertase in, (45) 820.
- Snowfall—
- and rate of melting in the Sierras, (42) 715.
 - effect on winter wheat growth, (43) 417.
 - effect on winter wheat yield, (42) U.S.D.A. 321.
 - measurements, methods, (43) U.S.D.A. 120.
 - of 1922-23 in United States, (49) 207.
 - of United States, (42) 117.
 - relation to run-off in California, (43) 618.
- Snowstorm in Palestine, (43) U.S.D.A. 120.
- Snowstorms, blizzards, and chinooks, (43) U.S.D.A. 120.
- Snuff, analyses, (42) N.Dak. 315.
- Snyder, J. L., biographical sketch, (41) 798.
- Soap—
- action on lead arsenates, (49) 553.
 - analysis, methods, (41) 314, 412; (48) 505.
 - colloid chemistry of, (41) 310.
 - determination, (41) 116.
 - fat determination in, (48) 805; (50) 614.
 - glycerol in, determination, (47) 206.
 - solution, use as egg preservative, (42) 212.
 - sprays, tests, (45) Conn.State 148.
 - stock, sampling and examination, (43) 805.
 - substitutes in Germany, (43) 204.

Soap—Continued.

- substitutes, Philippine plants used as, (48) 842.
 - tree, importation and use, (43) 840.
 - use against aphids, (49) N.C. 757.
- Soaps containing calcium, ash of, (43) 412.
- Soaps, inspection, (45) 365.
- Soapstone, use as solid lubricant, (49) 888.
- Soapweed as feeding stuff, Tex. (41) 70; (42) 369.
- Soapweed, digestibility and feeding value, (48) N.Mex. 266.
- Social psychology of rural population, (47) 896.
- Social resources of United States, (46) 191.
- Socialism and French agriculture, (49) 594.
- Society for Horticultural Science, (49) 104.
- Society of American Bacteriologists, new chart for, (44) 730.
- Society of American Florists and Ornamental Horticulturists, yearbook, (49) 743.
- Sociology, place in agricultural colleges, (44) 689.
- Sociology, rural, *see* Rural sociology.
- Sod disease of chickens, (45) Colo. 78.
- Soda—
- caustic, *see* Sodium hydrate and Sodium hydroxid.
 - effect on plant growth, (42) 436.
 - origin in soils, (42) 118.
 - pulp from coniferous wood, (46) 617.
 - water, bottled, precipitates in, (41) N.Dak. 669.
- Sodammonium—
- nitrate, fertilizing value, (42) 624.
 - sulphate, manufacture and fertilizing value, (41) 516.
- Sodatol, new agricultural explosive, (50) Mich. 484.
- Sodium—
- absorption by wheat seedlings, (41) 27.
 - acetate, effect on catalase production, (42) 708.
 - action on plants in presence of potassium, (45) 624.
 - ammonium nitrate—
 - action and use, (43) 125.
 - composition and action, (46) 820.
 - fertilizing value, (43) 221; (45) 330; (47) 322; (49) 20, 623.
 - ammonium sulphate—
 - action and use, (43) 125.
 - and ammonium sulphate, comparison, (46) 819.
 - fertilizing value, (49) 623.
 - and calcium, pseudo-antagonism, (48) Calif. 524; (49) 730.
 - arsenate—
 - effect on crops, (47) 120.
 - reduction of in dipping fluid, (42) 77.

Sodium—Continued.

- arsenate—continued.
 - solution for destruction of barberry, (49) U.S.D.A. 146.
 - toxic dose for dogs, (49) 381.
- arsenite—
 - as dipping fluid, (42) 76.
 - as hawkweed eradicator, (42) 439.
 - as locust poison, (49) 450.
 - for poisoning green timber, (42) 184.
 - in grasshopper baits, (49) Colo. 5.
 - oxidation in dipping fluid, (42) 76.
 - persistence in soil, (41) 625.
- as potassium substitute, (41) R.I. 426.
- aspartate, effect on amylase, (42) 203.
- assimilation, decrease by potash waste liquors, (42) 330.
- benzoate, inhibitive effect on fermentation, (42) 609.
- bicarbonate, effect on color of cooked vegetables, (43) 458.
- bisulphate—
 - use in conservation of liquid manure, (42) 721.
 - use in phosphate production, (43) 629.
 - utilization, (46) 718.
- bisulphite, analysis, (46) 114.
- carbonate—
 - analysis, (46) 114.
 - and sodium chlorid, relative absorption by soil, (43) 516.
 - determination, (42) 504.
 - effect on concrete, (47) Wyo. 189.
 - effect on moisture equivalent, (50) 421.
 - effect on oviposition of house fly, (47) 56.
 - effect on rye grass and oats, (45) 116.
 - effect on wood distillation, (47) 208.
 - equilibrium studies, (50) 813.
 - formation in soils, Calif. (48) 515; (49) 318.
 - removal from soils, (49) Calif. 319.
 - toxic limit for crops, (49) 513.
 - toxicity in soils, (42) Utah 719.
- chaulmoograte, therapeutic value in tuberculosis treatment, (44) Calif. 780.
- chlorid—*see also* Salt.
 - and sodium carbonate, relative absorption by soil, (43) 516.
 - determination in urine, (44) 806.
 - effect on absorption by orange trees, (49) Calif. 628.
 - effect on alfalfa, (50) 625.
 - effect on availability of soil potash, (43) Md. 121.
 - effect on catalase production, (42) 258, 259.
 - effect on composition of soil extracts, (43) Mich. 124.

Sodium—Continued.

- chlorid—continued.
 - effect on concrete, (47) Wyo. 188.
 - effect on conservation of liquid manure, (42) 721.
 - effect on germination of bunt spores, (47) 245.
 - effect on growth of *Endothia parasitica*, (44) 520.
 - effect on maritime plants, (43) 223.
 - effect on soil permeability, (47) 20.
 - effect on trees, (43) 343.
 - fertilizing value, (43) 630; (45) 521.
 - for pickling of butter, (42) Calif. 876.
 - for treatment of war wounds, (42) 272.
 - in feeding stuffs, (45) Tex. 14.
 - in milk, (49) 311.
 - separation of magnesium from, (44) 112.
 - tolerance as affected by lime, (42) 626.
 - tolerance limits for plants, Calif. (48) 515, 524.
 - toxicity in soils, (42) Utah 719.
 - use on meadows, (50) 434.
- compounds as neutralizing agents for cream, (43) 76.
- compounds in 1920, (46) 720.
- compounds, production in 1919, (44) 513.
- cyanid—
 - ammonia production from, (43) 220.
 - as soil insecticide, (44) 852.
 - effect on plants, (46) 544.
 - for peach borer control, (43) 359.
 - insecticidal value, (48) Ky. 356.
 - production, (46) 820.
 - use against nematode-infested soil, (41) Fla. 548, 660.
 - use against subsoil nematodes, (43) 47.
 - use against wireworm-infested soil, (41) N.J. 58.
- determination in—
 - blood, (42) 506; (46) 416.
 - feces, (46) 417.
 - serum, (45) 716; (47) 13.
 - urine, (46) 417.
- distribution in human blood, (48) 361.
- effect on different crops, (41) 229.
- excretion as affected by potassium feeding, (49) 464.
- ferrocyanid, ammonia production from, (43) 220.
- fertilization experiments, (48) 823.
- fluorid—
 - as poison for European earwig, (49) 850.
 - effect on rats, (45) 281.
 - effect on wheat, (48) 324.

Sodium—Continued.

fluorid—continued.

- insecticidal value, (44) U.S.D.A. 162.
- poisoning by, (50) 77.
- hippurate hydrolysis, (47) 484.
- hydrate, effect on digestibility of grain hulls, (47) 70.
- hydrogen sulphite, inhibitive effect on fermentation, (42) 609.
- hydroxid—
 - apparatus for dispensing, (49) 504.
 - effect on grain hulls, (49) 167.
 - treatment for straw, (48) 265.
- hypochlorite, effect on fowlbrood, (49) 156, Wis. 653.
- hyposulphite for water purification, (42) 683.
- in blood, determination, (45) 112; (50) 615.
- lamp, new type, (46) 111.
- morrhuate, use in tuberculosis treatment, (42) 777, 883.

nitrate—

- and acetate, effect on soil solubility, (41) Mich. 512.
- and ammonium sulphate, comparison, (48) Can. 323.
- and calcium nitrate, comparison, (42) 722.
- and manure, comparison, (42) 124.
- artificial, action and use, (43) 125.
- as hawkweed eradicator, (42) 439.
- availability as affected by soils, N.J. (41) 22; (44) 322; (46) 519.
- availability, factors affecting, (48) N.J. 325.
- determination of chlorates in, (41) 803.
- effect of time of application, (44) 319.
- nitrate, effect on—
 - apple and pear trees, (49) Can. 832.
 - composition of crops, (41) 422.
 - composition of soil extracts, (43) Mich. 124.
 - fruit production, (45) 439.
 - grain, relation to time of application, (48) 529.
 - lime requirements of soil, (44) Pa. 723.
 - mangels, (48) 630.
 - nitrogen in soils, (42) 425.
 - nutrition of tomato, (46) 538.
 - peaches, (48) 139, 140, S.C. 639.
 - rice yields, (44) 831.
 - seed germination, (44) Va. 722.
 - soil acidity, (41) 323; (42) 623; (47) R.I. 519.
 - soil permeability, (47) 20.
 - soils, (42) Calif. 814.

Sodium—Continued.

nitrate—

- fertilizing value, (41) Mass. 21, Ark. 130, 228, 229, Can. 516, N.C. 624, 723, 815, 825, 826; (42) Guam 37, 138, 521, 623, 721, Calif. 812; (43) Tex. 37, Ala.Col. 135, Oreg. 145, 221, 627, La. 627, Can. 727; (44) 217, 318, Ala.Col. 722, 815, Oreg. 835; (45) Miss. 37, Ala. Col. 45, Ala.Col. 119, Miss. 129, Ohio 232, Ohio 233, 816; (46) 818; (47) Ind. 139, Mo. 141, Mich. 143, Miss. 217, 322, 512, Wash.Col. 520; (48) 219, Can. 323, 520, Pa. 819, Ala. 833; (49) 623; (50) 423, 424, 624.
- hygroscopicity, (47) 321.
- industry, Chilean, (42) 124, 520.
- inferiority to ammonium sulphate, cause, (48) Calif. 517.
- limits of harmful effect, (41) 815.
- production and consumption, (41) 22.
- production in 1919, (44) 513.
- retail prices, U.S.D.A. (42) 219, 331.
- substitutes for, (42) 624.
- time of applying to corn and cotton, (43) Ala.Col. 233.
- tolerated by tobacco, concentration, (45) 343.
- v. sludges as fertilizers, (44) 24.
- value on cranberry soils, (45) N.J. 216.
- nitrite, action in soil, (50) 424.
- nitrite, fertilizing value, (48) 820.
- nitrite, reversible oxidation of, (42) 723.
- oleate, gold number determination, (43) 12.
- oxalate, N/100 solution, stability, (48) 710.
- perchlorate, disinfecting power, (43) 79.
- potassium cobaltic nitrite, verification of formula, (43) 803.
- removal from soil by drainage, (47) Ky. 122.
- salicylate, disinfecting power, (43) 79.
- salicylate, inhibitive effect on fermentation, (42) 609.
- salts—
 - as affected by various sulphates, (42) Calif. 813.
 - as soil amendments, (41) 326.
 - effect on calcium, (42) Calif. 811.
 - effect on intake of inorganic elements of plants, (50) Calif. 221.
 - effect on plant growth, (48) Calif. 524.
 - effect on potash solubility, (41) 126.
 - effect on soil acidity, (47) R.I. 519.

Sodium—Continued.

salts—continued.

- effect on soil structure, (41) 519;
(43) 516; (44) 422.
- solubility in alkali soils, (46) 421.
- toxicity, (41) 320.
- toxicity as affected by manure,
(41) 322.

selenate, action on molds in cheese,
(45) 477.

silicate as pruning wound dressing,
(44) S.C. 532; (47) 344; (49)
Ohio 235.

sulphate—

- as reagent in antitoxic sera con-
centration, (42) 775.
- effect on concrete, (47) Wyo. 188.
- effect on orange trees, (50) Calif.
327.
- effect on soil permeability, (47)
20.
- effect on wheat, (45) 116.
- fertilizing value, (41) 427; (46)
123.
- toxic limit for crops, (49) 513.
- toxicity in soils, (42) Utah 719.
- use in conservation of liquid ma-
nure, (42) 721.

sulphite, analyses, (41) 112; (46) 114.

sulphite, inhibitive effect on fermenta-
tion, (42) 609.

sulphocarbonate as insecticide, tests,
(42) 250.

thiocyanate, effect on plants, (46) 544.

tungstate, quality for blood analysis,
(47) 410.

utility in relation to plant growth,
(41) 820.

Soft drinks, bottled, (41) U.S.D.A. 669.

Softwood industry, technique, handbook,
(42) 349.

Soil—

absorption, studies, (43) 624.

acidity—*see also* Soils, acid, and
Liming.

action on germinating plants,
(47) 722.

agronomic significance, (49) 513.

aluminum factor, (41) 214, 428;
(42) 816; (44) 125.

and alkalinity, researches on,
(48) 811.

and nitrogen fixation, (49) Kans.
414.

and vegetation, correlation, (44)
419.

acidity as affected by—

- ammonium sulphate, (42) 623.
- crops and fertilizers, (50) 18.
- dicalcium silicate, (44) 24.
- fertilizers, (47) R.I. 519.
- green manure, (42) Va. 324; (43)
212.
- leaching and fertilizers, (47) 517.
- organic matter, (46) 118, 211.

Soil—Continued.

acidity as affected by—continued.

- phosphatic slag, (49) 21.
- potash salts, (46) 520.
- sodium nitrate, (42) 623.
- sulphur, (45) 26, 650; (46) N.J.
549; (50) 123.
- various crops, (41) R.I. 135.

acidity—

- as factor in fertility, (46) 811.
- as result of chemical phenomena,
(42) 216.

cause, (49) Wis. 622; (50) 318.

cause of toxicity, (47) Ind. 124.

determination, (41) 123; (42) Va
324; (43) 12, 21.

determination, factors affecting,
(43) 312.

determination in the field, (44)
418.

determination, iodine method, (46)
503.

ecological factor, (50) 513.

acidity, effect on—

acidity of plant juices, (42) 424.

Azotobacter, (49) 620.

crops, (47) 519.

earthworms, (49) 213.

growth of legume bacteria, (42)
Wis. 324.

nodule production, (45) Wis. 213.

potato scab, (41) 123.

seeds, (42) Wis. 324.

acidity—

exchange, cause, (45) 324.

factors affecting, (48) 619.

formation, (47) 723.

forms, (44) 813.

in cranberry bogs, (48) 343.

in northeast India, (46) 811.

injury to plants, (47) Calif. 620.

map of Long Island region, (50)
717.

measuring, (45) 323; (48) 812.

measuring by alkaline liquids,
(49) 619.

method of stating, (41) 205.

nature of, (42) Wis. 324; (45)
811; (49) 417.

notes, (42) 217.

of Ericaceae, (44) 419.

of Hawaiian soils, (50) 619.

of virgin v. cultivated soil, (43)
N.Dak. 319.

physiochemical aspects, (48) 118.

plant indicators of, (47) 519.

potential, (48) 718.

preference of conifers, (47) 442.

relation to lime requirement, (49)
320.

relation to plant distribution,
(44) 19; (45) 123; (47) 222,
619.

review of literature, (43) 212.

Soil—Continued.

acidity—continued.

- studies, (41) 319, 321; (43) 612, 713; (44) N.J. 316; (45) Ind. 117, 724; (49) 17; (50) Mass. 621, 726, 814.
- studies with peat and humus-forming plants, (41) 19.
- tests, (43) Wis. 622; (49) Wis. 623, 722.
- treatment, (50) R.I. 17.
- Truog test, modification, (50) 203.
- use of lime or ground chalk for, (49) 512.
- vertical distribution, (48) 119.
- acids, activity of, studies, (42) 423.
- aeration—
 - as affecting root growth, (41) 132, 134.
 - deficient, effect, (46) 25.
 - effect on growth of shoots, (45) 333.
 - effect on lime requirement of muck soil, (43) 212.
 - experiment with tomatoes, (49) 740.
 - factors affecting, (50) 318.
 - in India, (41) 522.
 - with helium, (45) 334.
- air, carbon dioxide content, (45) 323.
- air, investigations, (45) 16.
- air, rôle in hydrophytic habitats, (49) 29.
- alkalinity, determination in the field, (44) 418.
- amendments, action of, (41) 326.
- analysis, (42) Guam 16, N.Y. State 327; (43) 504, 621; (45) Colo. 118.
- analysis—
 - apparatus, (42) 119.
 - as affected by moisture equivalent, (43) 210.
 - as fertility index, (48) 719; (49) 723.
 - automatic registering method, (46) 814.
 - bacteriological, (45) 322.
 - effect of boiling and shaking, (42) 423.
 - effect of drying, (42) 422.
 - mechanical, (49) 210, 316.
 - mechanical, apparatus, (50) 809.
 - mechanical, as affected by colloidal content, (49) 316.
 - mechanical, methods, (45) 322.
 - methods, (41) 621; (44) 203; (45) 109; (49) 16; (50) 412.
 - mineralogical, treatise, (47) 810.
 - of Hagerstown silty clay loam, (49) Pa. 210.
 - Official method, (44) 9.
 - relation to hygroscopicity, (46) 421.
 - use of layer formation in, (46) 810.

Soil—Continued.

analysis—continued.

- value, (44) 17, Ohio 123, 508; (48) 512.
- value and limitations, (46) 620.
- and water ratio, (50) 512.
- awakening and seasonal rhythm, (46) 721.
- bacteria—
 - activity as affected by moisture, (44) 315.
 - activity as affected by salts, (49) 321.
 - activity as affected by soil treatment, (46) Mo. 315.
 - and plants, symbiotic relation, (47) 213.
- bacteria as affected by—
 - acidity, (44) 430.
 - arsenic, Mont. (44) 341; (46) 343.
 - low temperature, (42) N.Y. Cornell 435.
 - manure, (41) Del. 130, Ga. 130.
 - petroleum, (49) 19.
 - phosphates, (49) 21.
 - seasonal conditions, (43) Iowa 432.
 - soluble salts and moisture, (47) 723.
 - sulphur, (48) 723.
- bacteria—
 - composition as affected by sterilization on, (45) 422.
 - correlation of colon and aerogenes types, (43) 791.
 - counting, standardized medium for, (50) 816.
 - dissolution of organic nitrogen by, (49) 119.
 - distribution and activities, (42) 424.
- bacteria, effect on—
 - availability of phosphates, (43) 630.
 - etching power of roots, (43) 422.
 - nucleoproteid phosphorus, (50) 720.
 - nutrition of plants, (42) 25.
 - phosphate availability, (41) 131.
 - soil minerals, (42) Calif. 812.
- bacteria—
 - estimation, (50) 515.
 - lactose-fermenting, (41) 888.
 - nonspore-forming, in manured soil, (41) 20.
 - oxidation of vanillin by, (42) 425.
 - phosphate requirements, (41) 721.
 - potential activity of spores, (43) 625.
 - relation to trophic amoebae, (45) 213.
- bacterial analysis in Ontario, (42) 514.
- bacteriological studies, (50) 720.
- bacteriology, (45) Idaho 212.
- bacteriology, teaching, (47) 97.

Soil—Continued.

- basicity, measuring, (48) 812.
- biology, (45) Mich. 213; (47) 515; (49) 117.
- colloids—
 - absorption of water by, (48) 421.
 - adsorption of plant food by, (46) 810; (49) 17.
 - effect on availability of salts, (48) 214.
 - effect on mechanical analysis, (49) 316.
 - effect on reactions, (41) 720.
 - notes, (48) 618.
 - origin, (46) 809.
 - properties, (50) 317.
 - treatise, (44) 210; (49) 414.
- compression, effect on germination, (43) 722.
- condition—
 - and plant growth, treatise, (46) 809.
 - effect on bacteria and changes in soil substance, (49) 118, 813.
 - effect on citrus fumigation damage, (44) U.S.D.A. 251.
 - effect on flora and transformation of matter, (49) 118.
 - effect on night-air temperature, (48) U.S.D.A. 113.
 - peculiar, in San Luis Valley, (49) Colo. 513.
 - relation to ammonia formation, (46) 812.
 - relation to nitrate accumulation, (46) 813.
- constituents, rate of absorption, (42) 23.
- constituents, specific weight, (47) 18.
- contamination in poultry yards, (43) 378.
- cracks in Egyptian soils, rôle, (50) 512.
- crumb structure, formation, (47) 722.
- cultivation—
 - deep, (44) 812.
 - methods, (42) 514; (48) 616.
 - pulverizing machine for, (44) 587.
 - studies, (48) 817.
 - subsoiling v. ordinary, (42) 514.
- cultures, physiological balance, (41) Mich. 631.
- cultures, salt ratios in, (41) 820.
- differentiation, factors in, importance, (49) 616.
- drainage experiments, (45) Wis. 423.
- drainage, measurement, (46) 811.
- drainage, paper on, (48) 196.
- drifting, control and prevention in Saskatchewan, (49) 894.
- drifting in Canada, (45) Can. 815; (47) 119, 120.
- drifting in southern Alberta, (45) 809.
- dynamics, (50) 98.
- elutriator, new, description, (43) 210.

Soil—Continued.

- erosion—
 - and prevention in India, (42) 513.
 - by river, prevention, (42) 780.
 - in a drainage channel, (41) 483.
 - in forest lands, (45) 46.
 - in India, prevention, (50) 718.
 - in Indiana, (41) Ind. 130.
 - in Iowa, (42) 95.
 - in South Africa, (42) 122, 513.
 - paper on, (48) 196.
 - prevention, (42) 278, 888; (43) 281, 420, 481; (44) 316, Mich. 815; (45) 21; (47) 686.
 - studies, Mo. (41) 622; (43) 721; (46) 315; (48) 616.
- evaporation experiments, (42) 513.
- experiment fields, crop yields from, (41) Ill. 218.
- experiment fields, guide, (46) Mo. 511.
- experiment fields, value, (48) 810.
- extracts—
 - determination of magnesium in, (41) 313.
 - effect of crops, (44) 719.
 - effect of fertilizer salts on composition, (43) Mich. 124.
 - effect of manure, (41) 420.
 - mannite determination in, (49) 804.
 - salts from evaporation of, (43) 624.
- fauna of agricultural land, (49) 212.
- ferment, summary, (46) 513.
- fertility—
 - analysis as index, (48) 719.
 - and crop quality, (46) 623.
 - and fertilizers, (42) 515.
 - and productivity, maintenance (45) Mo. 24.
 - and soil management, (47) Minn. 319.
 - as affected by bacteria, (42) 19.
 - as affected by delayed clearing, (48) Minn. 321.
 - as affected by rotation, (42) S.Dak. 827.
 - as affected by sulphur, (48) Ky. 117; (50) Oreg. 724.
 - effect of alfalfa v. grain crops, (42) 425.
 - effect on wheat smut, (44) 539.
 - experiments, (41) Mass. 21, Ind. 218, Mo. 624, N.C. 624, N.Dak. 822; (42) Mass. 326; (43) N.Dak. 322, Ohio 322, Minn. 627, Minn. 814; (44) Minn. 321, N.Dak. 511, S.Dak. 626; (45) Pa. 214; (47) Pa. 418, Wis. 418; (48) Minn. 321.
 - experiments in Netherlands, (41) 638.
 - function of legumes in, (49) Ala. 725.
 - importance of soil reaction in, (46) 811.
 - in Corn Belt, (48) 120.

Soil—Continued.

fertility—continued.

- in Tropics, (42) 599.
- index, (48) 119; (49) 723; (50) 118, 517.
- maintenance, (42) Ohio 516; (43) Ohio 726; (44) Ky. 511, Mich. 815; (45) Ohio 119; (46) N.H. 318; (48) Ky. 116, N.Dak. 216.
- fertility, maintenance—
 - and exhaustion, (49) 616.
 - effect of rotation, (49) S.Dak. 510.
 - in New Jersey, (42) 290.
 - in Queensland, (43) 24.
 - on dairy farms, (43) 23.
- fertility—
 - microbiological analysis as index, (48) 816.
 - of meadows, (43) Ohio 322.
 - papers on, (45) 809.
 - program for Arkansas, (44) 321.
- fertility, relation to—
 - assimilation of nutrients by crops, (50) 17, 18.
 - microbiological data, (41) 321.
 - sulphur, (43) Ill. 517.
 - vitamins in grain, (46) 624.
- fertility—
 - rôle of bacteria in, (43) 124.
 - rôle of molds in, (42) 514.
 - studies, (43) Ky. 814; (44) U.S.D.A. 127, N.Y.State 320, 321, Del. 420, Oreg. 719, Oreg. 815; (45) Wash. 216, N.C. 423, Wis. 423, Del. 622, 727; (46) Mass. 19, 336, Guam 715; (47) Minn. 121, Miss. 216, La. 420, N.C. 520, Ill. 814; (48) Minn. 322; (49) Wash.Col. 209, Miss. 414, Okla. 414, Oreg. 510, R.I. 510, Wis. 620, Wis. 622, N.C. 724, Ohio 724; (50) Minn. 120.
 - studies in Delaware, (47) 814.
 - studies in India, (41) 131.
 - studies, results, (46) 120.
 - sulphur as factor in, (47) 21.
 - treatise, (49) 510.
 - work at Rothamsted, (50) 117.
- fiber, maintenance, (45) 809.
- flagellates, daily periodicity in numbers, (45) 213.
- flora, oxidizing, as affected by plant growth, (46) N.J. 526.
- flora, oxidizing, relation to green plants, (46) N.J. 513.
- fumigation for peach tree borer, (45) 758.
- fungi, notes, (48) 319; (50) 620.
- fungi injuring plants, (41) 655.
- fungi, method of counting, (47) 620.
- fungi, proteolytic enzymes, (41) 822.
- gases, examination, (47) 515.
- gases, studies, (49) 120; (50) 209.
- grubs, control, (44) V.I. 356.
- infection from seed corn, (48) Del. 643.

Soil—Continued.

- inoculation, (41) 125.
- inoculation with Azotobacter, effect, (47) 21.
- insecticides, tests, (44) 852.
- laterite, of Formosa, (47) 514.
- management, (43) Md. 122, Mo. 722; (44) Minn. 321, 510; (45) Mo. 215; (46) Mo. 315, 623; (48) Minn. 321, Mo. 616.
- management for fall seeded grain, (47) Mich. 814.
- management, German, to increase yields, (48) 817.
- management in Arkansas, (44) 720.
- management, Iowa system, (49) Iowa 724.
- management, principles, (44) 697.
- management, treatise, (41) 419, 624; (48) 817; (49) 510.
- measurements and hydrogen-electrode vessel, (47) 609.
- microorganisms, *see* Microorganisms.
- mixtures, size of grains in, (47) 18.
- moisture absorption, effect of pulverization and settlement of soil, (49) 512.
- moisture, action in tilled prairie land, (44) Ala.Col. 882.
- moisture as affected by—
 - cultivation, (41) 129, Mo. 622; (42) 514; (46) 537; (47) Ark. 724.
 - cultivation and weed growth, (41) Kans. 33.
 - forests, (43) 16; (44) U.S.D.A. 716.
 - manure, (43) 722.
 - mulches, (49) 317.
 - mulches and wind protection, (42) 716.
 - phosphates, (49) 21.
 - potash salts, (46) 627.
 - rolling, (43) 722.
 - trees, (48) 424.
 - various crops, (41) N.Dak. 823.
 - white pine removal, (48) 344.
- moisture—
 - capacity and wilting point, (48) 422.
 - capillarity, (44) 18.
 - changes, effect on soil properties, (41) N.Y.Cornell 121.
 - classification, (46) 810.
 - colloidal hypothesis, (43) 20.
 - conservation, (46) Wash. 217.
 - conservation by pruning, (43) 235.
 - conservation in dry land soils, (45) 40.
 - constants, relation to capillary potential, (44) 316.
 - control, (47) 216; (48) 617 Mo. 15.
 - determination, (42) S.C. 413; (44) 802.
 - determination, electrical method, (49) 317.

Soil—Continued.

moisture—continued.

determination of physiological conditions, (47) 515.

determination processes, (47) 18.

moisture, effect on—

bacteria of soil, (44) 315; (47) 723.

explosives, (42) Wis. 384; (43) U.S.D.A. 282.

Helminthosporium infection of wheat, (50) 649.

salt balance for plants, (46) N.J. 525.

seedling blight of wheat and corn, (49) 345.

water extracts, (42) 323.

moisture—

equivalent, effect on analysis, (43) 210.

equivalent, studies, (50) 421.

equivalent under irrigation, (42) 620.

excess of, effect on root development, (41) 820.

experiments, (42) Mich. 621.

factors affecting, (43) 210, 320.

holding capacity, capillary, (41) 422.

in heavy soils, studies, (42) Calif. 812.

in solid substrata, relation to salt balance, (42) 626.

in walnut grove, seasonal changes in, (50) Calif. 317.

initial, effect on movement, (44) 19.

loss by evaporation, (48) Calif. 585.

movement, (43) N.Mex. 738, Ky. 812; (45) 21.

movement after irrigation, (43) N.Mex. 386.

movement as affected by gravity, (43) U.S.D.A. 723.

movement as affected by initial moisture, (43) Ky. 320.

movement, capillary, (42) 216, 717; (43) U.S.D.A. 722.

movement, capillary transmission constant, (43) 812.

movement, studies, (46) Mo. 315.

movement upon freezing, (49) 617.

new classification, (45) 20.

paper on, (45) 809.

relation between heat of wetting, moisture equivalent, and unfree water, (43) 810.

moisture, relation to—

biological activity, (41) 812.

bunt infection of wheat, (44) 539.

cabbage yellows, (44) 643.

carbon dioxid formation, (46) 813.

forest planting, (47) 539.

irrigation practice, (41) 515.

Soil—Continued.

moisture, relation to—continued.

nutrient assimilation, (45) 214.

salt balance for plants, (48) 810.

sod effect on apple trees, (49) N.Y.Cornell 235.

solubility, (41) Mich. 512.

moisture—

sampling and composition, (41) 622.

streams, importance, (46) 422.

studies, (41) 622; (46) 116; (49) 211.

studies for wheat culture, (49) U.S.D.A. 829.

studies with prairie subsoils, (41) 514.

system, (48) 118.

molds, factors affecting number, (43) Iowa 432.

molds, growth inhibiting effect of H-ion, OH-ion, and salt concentrations, (49) Iowa 722.

mulches, effect on evaporation, (47) Calif. 617.

nutrients, active value of, (47) 24.

nutrients, availability to plants, (50) 619.

nutrients, effect of continuous cropping, (45) 329.

organism decomposing cellulose, (41) 632.

organisms—

activity as affected by root growth, (41) N.J. 28.

ammonification test, (41) Ga. 19.

as affected by sulphur and sulphuric acid, (41) 427.

dissemination by wind, (43) 842.

effect of liming and manuring, (49) Okla. 414.

nitrogen-fixing, (41) 125.

proteolytic enzymes, (41) 822.

relation to toxicity, (41) 624.

particle, diameter determination, (49) 415.

phosphorus, depletion, (50) 321.

phosphorus, determination, (44) 803.

phosphorus, organic, (41) 213.

physics, discussion, 45) 418.

physics, modern work on, (48) 421.

physics studies, (48) Calif. 512; (49) 210.

plate, number of colonies for, (43) 422.

poisoning, arsenical, (41) 625.

pollution from sewage, (46) 589.

pollution, relation to intestinal infections, (46) 588.

potash, solubility in salt solutions, (41) 126.

potassium—

availability, (47) Ohio 422.

liberation, (43) 127.

nickel crucibles for determination of, (42) 207.

studies, (45) Ohio 118.

Soil—Continued.

- potting, fumigation, (50) N.J. 56.
- preparation for field crops, (43) 321.
- pressure cell, apparatus for measuring, (44) U.S.D.A. 189.
- processes as affected by calcium carbonate, (46) 714.
- processes as affected by straw, (46) 423.
- productivity, increasing in Germany, (44) 22.
- profile at Buitenzorg, Java, (41) 719.
- profile studies in Michigan, (50) 617.
- profiles, preparation, (41) 810.
- reaction—
 - absolute, effect on Azotobacter flora and nitrogen-fixing ability, (49) 813.
 - and choice of fertilizers, (45) 330.
 - and phosphoric acid assimilation, (44) 722.
 - and plant development, (50) 532.
 - as affected by organic matter, (41) 319.
 - as affected by sodium nitrate, (41) 323.
 - chemical, (41) 720.
 - effect of fertilizers, (48) 216.
 - effect on Actinomycetes, (48) 212.
 - effect on growth, nodule formation, and calcium in legumes, (49) 825.
 - factors affecting, (50) 512.
 - litmus method for detecting, (50) 619.
 - method of stating, (41) 205.
 - relation to calcium adsorption, (50) 512.
 - relation to health and growth of plants, (43) 513.
 - studies, (42) 718; (50) 618.
- reclamation studies, (50) 16.
- renovation by use of legumes, (45) 329.
- sampler, new, description, (45) 723.
- samples—
 - examination, methods, (47) 514.
 - for analysis, preliminary treatment, (46) 814.
 - for analysis, shaking, (44) 18.
 - number required for chemical work, (50) 213.
 - pH value, effect of drying and storage, (50) 718.
- science, advances in, (50) 716.
- science lessons, (44) 194.
- science, methods of teaching, (43) 196.
- science, soil surveys in, (46) 620.
- separates, colloidal soil aggregates in, (49) 722.
- shrinkage, ecological significance, (47) 514.
- shrinkage in drained peat bog, (46) Wis. 186.
- sickness, cause of, (42) 130.
- silicates as affected by carbonic acid, (46) 821.

Soil—Continued.

- solubles as affected by fertilizers and plant growth, (44) N.Y.State 320.
- solution—
 - acid and alkaline, chemical reactions, (41) 720.
 - as affected by cropping, (41) 420.
 - composition and movement, (46) 117.
 - concentration and composition, (46) 420.
 - concentration around soil particles, (44) 812.
 - concentration as affected by chemical compounds, (47) 512.
 - concentration, effect on cell sap, (43) 515.
 - conditions for obtaining, (47) 504.
 - direct-pressure method for securing, (48) 718.
 - electrical conductivity, (46) 517.
 - ferrous sulphate as modifier, (46) 812.
 - importance to plant growth, (50) 211.
 - laws, relation to use of lime in agriculture, (49) 518.
 - method of obtaining, (42) Calif. 819; (50) 211.
 - osmotic pressure, (50) 517.
 - relation to plants, (48) 18.
 - relation to soil extract, (44) 621.
 - sampling and analyses, (41) 622.
 - studies, (41) Mich. 630; (42) 215; (44) 19.
 - volume, effect on plant growth, (50) 212.
- stimulants, experiments with, (49) 23.
- stratification and H-ion concentration in woodlands, (49) 417.
- sulphur and organic matter, correlation, (49) Ill. 315.
- survey, acidity tests as aid in, (49) 616.
- survey and field experiments, (49) Iowa 210.
- survey in Alabama—
 - Fayette Co., (44) U.S.D.A. 210.
 - Geneva Co., (50) U.S.D.A. 617.
 - Houston Co., (49) U.S.D.A. 415.
 - Marengo Co., (50) U.S.D.A. 319.
 - Morgan Co., (45) U.S.D.A. 621.
 - Shelby Co., (43) U.S.D.A. 511.
 - St. Clair Co., (44) U.S.D.A. 211.
- survey in Arizona, Gila Valley area, (44) U.S.D.A. 316.
- survey in Arkansas—
 - Drew Co., (42) U.S.D.A. 15.
 - Faulkner Co., (41) U.S.D.A. 127.
 - Howard Co., (41) U.S.D.A. 317.
 - Perry Co., (50) U.S.D.A. 519.
- survey in Bengal, (42) 121, 122.
- survey in California—
 - Anaheim area, (41) U.S.D.A. 127.
 - Brawley area, (50) U.S.D.A. 519.
 - El Centro area, (48) U.S.D.A. 210.

Soil—Continued.

survey in California—continued.

Grass Valley area, (45) U.S.D.A. 419.

Los Angeles area, (41) U.S.D.A. 511.

Middle San Joaquin Valley, (41) U.S.D.A. 211.

San Joaquin Valley, (46) U.S.D.A. 17.

Santa Maria area, (41) U.S.D.A. 211.

Shasta Valley area, (49) U.S.D.A. 415.

southern area, (46) U.S.D.A. 213

Ventura area, (43) U.S.D.A. 512.

Willits area, (44) U.S.D.A. 718.

survey in Delaware, Kent. Co., (43) U.S.D.A. 719.

survey in Egypt, zone No. 1, (48) 813.

survey in Egyptian Delta, (41) 318.

survey in Florida—

Duval Co., (49) U.S.D.A. 719.

Flagler Co., (48) U.S.D.A. 115.

Orange Co., (48) U.S.D.A. 211.

St. Johns Co., (43) U.S.D.A. 719.

survey in Georgia—

Burke Co., (42) U.S.D.A. 322.

Butts and Henry Cos., (47) U.S.D.A. 618.

Coweta, Fayette, and Monroe Cos., (48) U.S.D.A. 510.

Early Co., (45) U.S.D.A. 325.

Floyd Co., (45) U.S.D.A. 325.

Lowndes Co., (44) U.S.D.A. 211.

Madison Co., (44) U.S.D.A. 812.

Mitchell Co., (48) U.S.D.A. 316.

north-central area, (48) U.S.D.A. 419.

Pierce Co., (44) U.S.D.A. 211.

Pulaski Co., (43) U.S.D.A. 811.

Rockdale Co., (50) U.S.D.A. 117.

survey in Idaho—

Kootenai Co., (48) U.S.D.A. 716.

Nez Perce and Lewis Cos., (44) U.S.D.A. 211.

Portneuf area, (47) U.S.D.A. 318.

survey in Illinois—

Adams Co., (48) Ill. 615.

Iroquois Co., (47) Ill. 415.

Livingston Co., (50) Ill. 418.

west-central northern area, (46) Ill. 712.

survey in India, alluvial soils, (49) 416.

survey in Indiana—

Adams Co., (49) U.S.D.A. 511.

Cass Co., (43) 419.

Decatur Co., (48) U.S.D.A. 317.

Lake Co., (45) U.S.D.A. 19.

survey in Iowa—

Adair Co., (46) U.S.D.A. 118; (49) Iowa 810.

Black Hawk Co., (42) U.S.D.A. 15; (45) Iowa 513.

Boone Co., (49) U.S.D.A. 415.

Soil—Continued.

survey in Iowa—continued.

Buena Vista Co., (41) U.S.D.A. 620; (45) Iowa 513.

Cedar Co., (45) U.S.D.A. 723; (49) Iowa 811.

Clay Co., (45) Iowa 421.

Clinton Co., (45) Iowa 420.

Dickinson Co., (50) U.S.D.A. 519.

Dubuque Co., (50) U.S.D.A. 520.

Emmet Co., (49) U.S.D.A. 719.

Fayette Co., (47) U.S.D.A. 318.

Hamilton Co., (43) U.S.D.A. 122; (47) Iowa 211.

Hardin Co., (50) U.S.D.A. 716.

Henry Co., (41) U.S.D.A. 621; (45) Iowa 513.

Johnson Co., (47) U.S.D.A. 119.

Lee Co., (45) Iowa 419.

Linn Co., (42) U.S.D.A. 716; (45) Iowa 513.

Louisa Co., (45) U.S.D.A. 114; (47) U.S.D.A. 19, Iowa 211.

Madison Co., (46) U.S.D.A. 422; (49) Iowa 810.

Mahaska Co., (46) U.S.D.A. 814.

Marshall Co., (46) U.S.D.A. 422; (49) Iowa 810.

Mills Co., (49) U.S.D.A. 315.

Mitchell Co., (45) Iowa 421.

Montgomery Co., (41) U.S.D.A. 17; (45) Iowa 512.

Palo Alto Co., (46) U.S.D.A. 17; (48) Iowa 316.

Polk Co., (46) U.S.D.A. 17; (48) Iowa 510.

Ringgold Co., (45) Iowa 420.

Scott Co., (45) Iowa 420.

Sioux Co., (45) Iowa 419.

Van Buren Co., (45) Iowa 420.

Wapello Co., (42) U.S.D.A. 119; (45) Iowa 514.

Wayne Co., (44) U.S.D.A. 18; (45) Iowa 723.

Webster Co., (45) Iowa 419.

Winnebago Co., (46) U.S.D.A. 214; (48) Iowa 511.

Woodbury Co., (50) U.S.D.A. 617.

Wright Co., (45) U.S.D.A. 721.

survey in Kansas, Leavenworth Co., (49) U.S.D.A. 416.

survey in Kentucky, Logan Co., (47) U.S.D.A. 811.

survey in Kentucky, Shelby Co., (41) U.S.D.A. 128.

survey in Louisiana—

La Salle Parish, (43) U.S.D.A. 720.

Sabine Parish, (46) U.S.D.A. 815.

St. Martin Parish, (41) U.S.D.A. 18.

survey in Maine, Aroostook area, (45) U.S.D.A. 115.

survey in Maryland—

Anne Arundel Co., (41) 318.

Baltimore Co., (42) U.S.D.A. 15.

Soil—Continued.

- survey in Maryland—continued.
 - Carroll Co., (48) U.S.D.A. 419.
 - Charles Co., (48) U.S.D.A. 16.
 - Frederick Co., (48) U.S.D.A. 317.
 - Washington Co., (42) U.S.D.A. 323.
- survey in Michigan—
 - Calhoun Co., (41) U.S.D.A. 128.
 - Detroit area, (45) Mich. 325.
 - Ontonagon Co., (50) U.S.D.A. 319.
 - St. Joseph Co., (49) Mich. 16, U.S.D.A. 720.
- survey in Minnesota, Stevens Co., (48) U.S.D.A. 17.
- survey in Mississippi—
 - Amite Co., (41) U.S.D.A. 128.
 - Choctaw Co., (49) U.S.D.A. 416.
 - Lamar Co., (47) U.S.D.A. 618.
 - Madison Co., (43) U.S.D.A. 720.
 - Pearl River Co., (44) U.S.D.A. 619.
 - Pike Co., (45) U.S.D.A. 326.
 - Simpson Co., (46) U.S.D.A. 316.
 - Smith Co., (49) U.S.D.A. 720.
- survey in Missouri—
 - Callaway Co., (41) U.S.D.A. 128.
 - Chariton Co., (46) U.S.D.A. 119.
 - description of work, (45) Mo. 114.
 - Knox Co., (45) U.S.D.A. 115.
 - Lafayette Co., (50) U.S.D.A. 617.
 - Lincoln Co., (44) U.S.D.A. 417.
 - Reynolds Co., (46) U.S.D.A. 214.
 - St. Francois Co., (45) U.S.D.A. 724.
 - St. Louis Co., (50) U.S.D.A. 419.
 - Texas Co., (42) U.S.D.A. 120.
- survey in Nebraska—
 - Banner Co., (46) U.S.D.A. 18.
 - Chase Co., (42) U.S.D.A. 16.
 - Cheyenne Co., (44) U.S.D.A. 123.
 - Dakota Co., (46) U.S.D.A. 422.
 - Madison Co., (49) U.S.D.A. 416.
 - Morrill Co., (43) U.S.D.A. 209.
 - Redwillow Co., (46) U.S.D.A. 422.
 - Sheridan Co., (45) U.S.D.A. 621.
 - Sioux Co., (48) U.S.D.A. 420.
- survey in New Jersey—
 - Belvidere area, (44) U.S.D.A. 18.
 - Bernardsville area, (49) U.S.D.A. 720.
 - Chatsworth area, (50) U.S.D.A. 319.
 - Millville area, (44) U.S.D.A. 718.
- survey in New York—
 - Chenango Co., (44) U.S.D.A. 211.
 - Cortland Co., (42) U.S.D.A. 16.
 - Oswego Co., (41) U.S.D.A. 129.
 - Saratoga Co., (41) U.S.D.A. 212.
 - Schoharie Co., (42) U.S.D.A. 16.
 - Wayne Co., (49) U.S.D.A. 721.
 - White Plains area, (48) U.S.D.A. 317.
- survey in North Carolina—
 - Beaufort Co., (42) U.S.D.A. 120.
 - Bertie Co., (44) U.S.D.A. 212.
 - Buncombe Co., (50) U.S.D.A. 618.

Soil—Continued.

- survey in North Carolina—continued.
 - Caldwell Co., (41) U.S.D.A. 419.
 - Guilford Co., (49) U.S.D.A. 315.
 - Hoke Co., (45) U.S.D.A. 326.
 - Moore Co., (46) U.S.D.A. 815.
 - Onslow Co., (50) U.S.D.A. 419.
 - Orange Co., (45) U.S.D.A. 326.
 - Tyrrell Co., (50) U.S.D.A. 717.
 - Vance Co., (45) U.S.D.A. 327.
 - Wilkes Co., (45) U.S.D.A. 327.
- survey in North Dakota—
 - Sargent Co., (43) U.S.D.A. 123.
 - Traill Co., (43) U.S.D.A. 209.
- survey in Ohio—
 - Mahoning Co., (41) U.S.D.A. 18.
 - Sandusky Co., (44) U.S.D.A. 316.
- survey in Oklahoma, Canadian Co., (42) U.S.D.A. 16.
- survey in Oregon—
 - Josephine Co., (49) U.S.D.A. 721.
 - Multnomah Co., (49) U.S.D.A. 316.
 - Washington Co., (48) U.S.D.A. 812.
 - Yamhill Co., (43) U.S.D.A. 512.
- survey in Pennsylvania, Mercer Co., (41) U.S.D.A. 810.
- survey in Philippines, (47) 595.
- survey in Punjab, (41) 621.
- survey in Scotland, (41) 797.
- survey in Sétif region, Algeria, (48) 420.
- survey in South Australia, (42) 122.
- survey in South Carolina—
 - Horry Co., (43) U.S.D.A. 812.
 - Kershaw Co., (47) U.S.D.A. 619.
 - Marlboro Co., (42) U.S.D.A. 120.
 - Newberry Co., (45) U.S.D.A. 421.
- survey in southwestern Ontario, (50) 717.
- survey in Tennessee, Meigs Co., (46) U.S.D.A. 119.
- survey in Texas—
 - Bowie Co., (46) U.S.D.A. 18.
 - Denton Co., (48) U.S.D.A. 211.
 - Erath Co., (49) U.S.D.A. 721.
 - Freestone Co., (46) U.S.D.A. 119.
 - Lubbock Co., (43) U.S.D.A. 512.
 - northwest area, (48) U.S.D.A. 116.
 - Red River Co., (49) U.S.D.A. 416.
- survey in Turkey, Diahlah area, (46) 511.
- survey in United States in 1914, (41) U.S.D.A. 317.
- survey in United States in 1915, (42) U.S.D.A. 420.
- survey in Utah, Ashley Valley, (50) U.S.D.A. 814.
- survey in Utah, Delta area, (48) U.S.D.A. 511.
- survey in Virginia—
 - Accomac and Northampton Cos., (43) U.S.D.A. 513.
 - Pittsylvania Co., (48) U.S.D.A. 17.

Soil—Continued.

- survey in Washington—
 - Benton Co., (41) U.S.D.A. 129.
 - Spokane Co., (45) U.S.D.A. 327.
 - Wenatchee area, (48) U.S.D.A. 17.
- survey in West Virginia—
 - Barbour and Upshur Cos., (41) U.S.D.A. 318.
 - Braxton and Clay Cos., (44) U.S.D.A. 317.
 - Fayette Co., (45) U.S.D.A. 621.
 - Nicholas Co. (48) U.S.D.A. 318.
 - Webster Co., (43) U.S.D.A. 720.
- survey in Wisconsin—
 - Jackson, Kenosha, and Racine Cos., (48) U.S.D.A. 512.
 - northern area, (46) 511.
 - Outagamie Co., (45) U.S.D.A. 421.
 - Rock Co., (44) U.S.D.A. 619.
 - Waupaca Co., (43) U.S.D.A. 123.
 - wild land areas, (49) 100.
- survey in Wyoming-Nebraska, Fort Laramie area, (45) U.S.D.A. 115.
- survey mapping, (43) 887.
- survey, papers on, (47) 210; (49) 616.
- survey, uses, (45) U.S.D.A. 723.
- Survey Workers, American Association of, (44) 300.
- surveys, device for making, (43) Tex. 281.
- surveys, procedure, (46) 620.
- suspensions, formation of layers in, (46) 810.
- system, rôle of organic matter in, (48) 119.
- teaching, elementary, (44) 697.
- temperature—
 - and moisture, effect on cabbage yellows, (49) 542.
 - as affected by burning, (49) 225.
 - as affected by phosphates, (49) 21.
 - as affected by vegetation, (46) 720.
 - as affected by weather, (44) 617.
 - daily changes, (43) 321.
 - degree of cooling without freezing, (44) 620.
- temperature, effect on—
 - absorbing properties, (46) 622.
 - cereal blight, (47) 246.
 - corn seedling blight, (50) 548.
 - Corticium vagum, (50) 348.
 - Helminthosporium infection of wheat, (50) 649.
 - nodule production, (46) 124.
 - pathogenicity of Corticium vagum, (47) 352; (49) 347.
 - potash scab, (47) Wis. 841.
 - relation of roots to oxygen, (50) 627.
 - root growth, (41) 134.
 - seedling blight of wheat and corn, (49) 345.
 - yield and water relations of beans, (45) 336.
- temperature—
 - factors determining, (47) 117.
 - fluctuations in, (43) Md. 121.

Soil—Continued.

- temperature—continued.
 - in a desert, (47) U.S.D.A. 415.
 - in upland and bottomland forests, (46) 211.
 - instruments for studying, (47) 117.
 - measuring, (50) 318.
- temperature, relation to—
 - cabbage yellows, (44) 643.
 - disease in plants, (49) 240.
 - potato scab, (44) 646.
 - solubility, (41) Mich. 512.
 - that of springs, (43) 321.
 - underground water, (49) 789.
- temperature—
 - studies, (41) 422; (50) 718.
 - survey of United States and Canada, (41) 16, 210; (45) 335.
 - under a steam pan, (50) 745.
 - weekly average, (49) Ky. 509.
- tube, improved, development, (47) 618.
- type and chemical composition, relation, (49) 616.
- type, effect on evaporation, (50) 812.
- type, variations within, (49) 616.
- types—
 - as basis for soil studies, (48) 115.
 - determining, examination, and comparison, (50) 418.
 - early definition, (47) 211.
 - effect of climatic factors, (48) 210.
 - of northern Michigan, (49) Mich. 898.
 - plant indicators of, (47) 519.
 - value and fertilizer requirements, (47) 210.
- vaccine tests, (45) 810.
- volume, effect on plant growth, (41) 813.
- yields, law of decreasing, (45) 329.
- Soiling crops—
 - feeding value, (49) Oreg. 579.
 - for dairy cows, (41) Iowa 181, 184; (48) 876.
 - rotation experiments, (41) 229.
 - v. silage, feeding value, (47) Iowa 78.
- Soils—
 - abnormality in cylinder experiments, (41) 423.
 - absorbent power for ammonia, (49) 515.
 - absorbent power for manganese, (44) 21.
 - absorption in, hypothesis, (48) 117.
 - absorptive power, (46) 621.
 - absorptive power, effect of pulverization and settlement, (49) 512.
 - absorptive power, effect of temperature, (46) 622.
 - acid—see also Soil acidity.
 - active aluminum in, (49) 804.
 - effect of calcite and magnesite, (42) 330.
 - effect of lime on biological processes, (49) Oreg. 514.

Soils—Continued.

acid—continued.

- effect on nodule bacteria, (49) 619.
- effect on zinc-coated pots. (43) 27.
- fate of superphosphate applied to. (50) 218.
- fertilizer experiments, (44) 319.
- H-ion concentration and active aluminum in, correlation, (50) 220.
- humiferous, as affected by lime. (43) 325.
- in Greece, (47) 121.
- inversion of cane sugar by, (46) 621.
- lime requirements, (43) 115.
- manganese in, (42) Ala.Col. 815.
- manuring experiments, (45) 516.
- nature and treatment, (46) 621.
- of lower Seine country, (49) 512.
- red, in Madhupur Jungle, (50) 16.
- studies, (45) 514; (47) 518.
- treatment, (46) R.I. 220.
- Trufast test for, (43) 20.
- active phosphoric acid content and use by crops, (45) Tex. 23.
- adjacent, variation of composition, (44) 213.
- adobe, calcium compounds for, (46) 521.
- adsorbed bases in, estimating, (50) 118.
- adsorption in, (42) 717; (48) 618; (50) 16.
- adsorptive appearances in, (45) 323.
- adsorptive unsaturated, studies, (42) 621.
- agricultural, formation and properties, (48) 810.
- agricultural, in Germany, distribution, (46) 815.
- algal formation in, (42) 726.
- alkali, *see* Alkali.
- alluvial, along Ganges, nitrate in, (49) 322.
- alluvial, deposited by the Nile, (42) 420.
- alluvial, of Fiji, (46) 316.
- ammonia determination in, (43) 211.
- ammoniacal-nitrate, analysis, (44) 202.
- ammonification, *see* Ammonification.
- and agriculture of Southern States, treatise, (45) 18.
- and chemical compounds, reaction between, (45) Mich. 619.
- and crops, course of study, (44) 596.
- and crops, exercises in, (44) 697.
- and crops, textbook, (41) 96.
- and fertilizers, (47) Minn. 319, 721.
- and fertilizers, exercises for vocational schools, (42) 196.
- and insects, relation, (48) 749.
- and manures in New Zealand, treatise, (42) 511.

Soils—Continued.

- and plant relationships, studies with dilatometer, (45) 336.
- and plants, interrelations, (47) Calif. 210.
- and soil formation, rôle in colloid chemistry, (42) 118.
- aqueous vapor pressure, (46) 18.
- arid, in the Punjab, properties, (50) 420.
- arsenic in, (46) 814.
- ash, of Germany, fertilizer requirements, (50) 817.
- at Rothamsted, protozoa in, (44) 126.
- availability of plant nutrients, (46) Ky. 816.
- azofication in, effect of salts, (47) 516.
- Azotobacter in, (48) 120.
- Bacillus botulinus in, (49) 860, 861, 862.
- Bacillus tetani in, (49) 863.
- "bara," studies, (41) 720.
- bare and cultivated, evaporation from, (50) 117.
- bare, mulched, and weed-grown. moisture and nitrate content, (41) Kans. 33.
- barium in, (43) Ky. 327.
- bhata, biological studies, (41) 812.
- bhata, chemical and biological studies, (45) 328.
- biological activity in relation to moisture and cropping, (41) 812.
- biological data, relation to fertility, (41) 321.
- black, in Germany, analyses, (42) 420.
- blowing, (41) U.S.D.A. 442.
- blowing, prevention, N.Mex. (47) 333; (49) 514.
- blue grass sod, fertilizer experiments, (48) Ky. 129.
- bog, *see* Bog.
- brown, degeneration, (47) 119.
- burned and unburned, analyses, (49) 118.
- burned mineral, fertility, (48) Minn. 320.
- cacao, as affected by shading, (41) 213.
- calcium carbonate determination in, (47) 18.
- calcium determination in, (44) 19; (47) Ky. 122.
- calcium in, relation to soil reaction, (45) 116.
- calcium removal from, (46) N.Y.Cornell 210.
- capacities for irrigation water, (48) 88.
- capillarity, effect of pulverization and settlement, (49) 512.
- capillary ascent of liquids in, (48) 18.
- capillary water movement, (44) U.S.D.A. 189.

Soils—Continued.

- carbon content, (47) 722.
- carbon determination in, (41) 206.
- carbon dioxide—
 - ammonia, and nitrate formation, (41) 421.
 - and hydrogen reaction, (41) 720.
 - balance, factors affecting, (43) 510.
 - determination in, (44) 203.
 - in, (43) N.Y.Cornell 812.
 - in, apparatus for measuring, (47) 212.
 - in, effect on plants, (47) 815.
- carbonates in, (45) 811.
- carbon-nitrogen ratio in, (46) 715.
- Caribou loam, fertilizer requirements, (41) Me. 131.
- catalytic action, (49) 418.
- chemical equilibrium in, (44) 812.
- chemistry of, (41) 201, 501; (43) 122.
- chlorid determination in, (43) 311.
- chlorin content, (45) 818.
- classification, (41) 316, 620, 621; (47) 210; (48) 16; (49) 616.
- classification, auxotaxic curve in, (50) 417.
- classification, treatise, (44) 417.
- clay, *see* Clay.
- colloidal—*see also* Soil colloids.
 - and noncolloidal, absorptive capacities, (48) U.S.D.A. 318.
 - clay in, (48) 810; (49) 811.
 - clay percentage, relation to contraction, (41) 812.
 - condition, reversibility, (41) N.Y. Cornell 121.
 - function in, (48) 17.
 - material in, estimation, (50) U.S. D.A. 811.
 - matter, quantity in, (45) 804.
- color in, relation to organic matter, (49) Iowa 318.
- color standards, (47) 210.
- colorimetric determination of pH, (43) 211.
- composition—
 - and preparation, (47) 317.
 - effect of irrigation water, (48) 118.
 - effect of manure, (41) 420.
 - effect of rainfall, (49) Wash.Col. 211.
- conservation, (44) Kans. 213.
- containing heavy minerals, mechanical analysis, (50) 418.
- cooling at night, (42) 214.
- copper content of, (42) 423.
- course, field problem in, (47) 799.
- course in uniformity, (47) 696.
- courses in, papers on, (48) 195.
- courses in Smith-Hughes schools, (46) 791.
- courses, laboratory work, (41) 896.

Soils—Continued.

- cropped—
 - and cultivated, water absorption and run-off on, Mo. (41) 622; (43) 721.
 - and fallowed, comparison, (47) 513.
 - and virgin, (43) Mich. 622.
 - and virgin, solution, (41) 420.
 - nitrification, (41) 720, 812.
- delta, fertilizer requirements, (47) Ark. 520.
- density in, determination, (48) 615.
- dephenolization in, (45) 813.
- depletion by chemical denudation, (48) 617.
- disinfection, (41) 49; (42) 243, 450, 717, 718; (45) 727; (47) 216; (48) 619.
- dispersoid content, (47) 205.
- distribution and description, handbook, (46) 511.
- distribution of electric currents from traction lines, (43) 625.
- "djati" forest, of Java, (49) 16.
- dry, effect on plants, (44) 631.
- dry, swelling coefficients, (48) Ariz. 421; (49) 317.
- dry-bog, of California, (49) 417.
- drying, effect, (47) 215, 713.
- effect of—
 - calcium sulphate, (42) Mich. 331.
 - cultivation, (42) 123.
 - dicyandiamid, (43) 426.
 - fertilizers, (47) R.I. 519.
 - fertilizers on pH, (43) 423.
 - freezing, (44) 812.
 - freezing and thawing, (42) 423.
 - heat, (42) Wis. 350.
 - irrigation water, (42) 119, Calif. 812.
 - Kafir corn and milo maize, (41) Kans. 34.
 - lime, (47) 624.
 - lime and manure, (43) Okla. 32.
 - long-time fertilizer experiments, (42) 720.
 - neutral salt solutions, (49) 17.
 - potash, (44) N.Y.Cornell 817.
 - raw sulphur on, (44) Mich. 129.
 - salts, (45) 21.
 - season and crop growth, (44) 620.
 - sodium nitrate, (42) Calif. 814.
 - sodium salts, (47) 20.
 - straw, (43) Wash. 726.
 - sulfofication, (43) 517.
 - sulfofication and nitrification, (41) 324.
 - sulphur and sulphuric acid, (41) 427.
- effect on ash constituents of crab grass, (41) 502.
- effect on composition of crops, (41) 422, 813.
- electrical conductivity of, (44) 17.

Soils—Continued.

- evaporation of water from, (50) 812.
- examination, (41) 423.
- fallowed and cropped, nitrogen content, (46) 714.
- fertilized, potash in, (44) Pa. 717.
- fertilizer in, penetration of, (44) Calif. 722.
- fertilizer requirements, (44) Ky. 510; (45) Guam 23; (49) Iowa 723.
- fertilizer requirements as determined by crop analysis, (43) 323, 518; (44) 815.
- fertilizer requirements, determination, (42) 719; (46) 424; (49) 815.
- fire fang of, (45) 726.
- flocculation, (44) 508; (47) 722; (50) 810.
- flocculation as affected by ions, (48) 618.
- flocculation in, mechanism, (48) 117.
- fluorin in, (41) 126.
- forest, *see* Forest soils.
- formation, (46) 619.
- formation by silting, (42) 420.
- formation of soluble substances in, (44) 124.
- formation, requirements for, (43) 209.
- formation, treatise, (44) 417.
- freezing-point lowering, studies, (43) 515.
- frost penetration in, (44) 618.
- frozen, bacteria in, (43) 422.
- frozen, movement of moisture in, (49) 617.
- glacial drift, of Minnesota, (45) 19.
- glacial drift, of Scotland, (44) 123.
- grassed and cultivated, carbon dioxide determination in, (47) 515; (49) 120.
- greenhouse, sterilization, (49) Ind. 636.
- hardpan, improved, (47) Okla. 815.
- hardpan, relation to root penetration, (48) 212.
- hardpan, studies, (50) 14.
- heat retention by, (42) 215.
- heated, effect on germination and plant growth, (41) 215.
- heated, relation to root cork, (43) 732.
- heating experiments, (41) Hawaii 138.
- heavy calcareous, grape stocks for, (47) 344.
- heavy, clay determination in, (47) 118.
- heavy, cultivation, effect of chalk, (46) 88.
- heavy, moisture equivalent, (50) 421.
- humus, aqueous solutions of, (43) 725.
- humus determination in, (41) 803; (50) 202.
- humus, humin acids in, (43) 213.
- humus lime, transformation, (47) 19.
- humus, liming, (46) 621.
- humus, of Sweden, classification, (41) 511.

Soils—Continued.

- humus-poor, of Sweden, classification, (41) 510.
- H-ion concentration in, (41) 123; (49) 309; (50) 316.
- hygroscopicity and composition, (46) 421.
- hygroscopicity in, (46) 810.
- improvement, (47) 216.
- improvement—
 - for corn, (43) 422.
 - for quality of products, (49) Mich. 419.
 - green manure for, (45) Wis. 214.
 - in Switzerland, (44) 380.
 - role of lime in, (43) 128, 428.
 - with lupines, (43) 321.
 - with peat and moor soils, (43) 22.
 - with white alder, (50) 838.
- in colored water extract, colorimetric determination, (46) 806.
- infertile, cause, (46) Mont. 316.
- infested by wireworms, (44) S.C. 59.
- injurious effects on plants, (43) 513.
- injurious to plants, effect of liming, (48) 220.
- interpreting by phytometer method, (41) 327.
- introductory courses in, (43) 196.
- inverting power, (41) 321.
- iron-depositing bacteria in, (42) 575.
- irrigated—
 - as affected by aluminum sulphate, (47) 221.
 - studies, (45) Ariz. 485.
 - tropical, origin of soda in, (42) 118.
 - water-holding capacity, (48) Utah 780.
- Kirkland, effect of lime and organic matter, (45) Okla. 422.
- laboratory exercises in, (42) 496.
- leaching, effect on availability of rock phosphate, (43) 427.
- leaching of nitrates and ammonia from, (49) 419.
- lime requirement, (41) 428, 520; (43) Wis. 622; (44) Pa. 722; (47) 27, 324, N.H. 422.
- lime requirement—
 - as affected by sulphur, (46) 428.
 - determination methods, (43) 713; (47) 518, 818.
 - effect of organic treatments, (46) 118.
 - end-point, (41) 123.
 - factors affecting, (43) 312.
 - for plant production, (49) 619.
 - relation to acidity, (49) 320.
 - relation to ammonia retention, (41) 320.
 - relation to pH, (43) 421, 515; (46) 812; (48) 215.
- limed and unlimed, analyses, (43) 128.
- limed, oxidizing power, (44) 19.

Soils—Continued.

- loss of nitrates in drainage water, (43) 19.
- loss of sulphates from, factors affecting, (50) 521, 523.
- magnesia impregnated, (46) 316.
- magnesium determination in, (43) N.Dak. 319.
- magnesium removal from, (46) N.Y.Cornell 210.
- manganese, methods of handling, (41) Hawaii 138, 148.
- manured, ammonification in, (41) 20.
- mapping, (41) 316, 810.
- marsh, *see* Marsh soils.
- mechanical composition, effect on nitrogen utilization, (41) N.J. 22.
- mechanical composition, effect on solubility, (41) Mich. 512.
- mechanical properties, effect on root growth, (48) 513.
- mineral and moor mixtures, (42) 622.
- mineral, neutralizing value, (48) Mich. 319.
- modification through climatic influences, (48) Calif. 517.
- modulus of rupture, index of structure, (50) 809.
- mold hyphae in, (46) 431.
- molkenboden, chemical studies, (49) 811.
- moor, *see* Moor and Peat.
- mountain, of North Carolina, fertilizer requirements, (44) 127.
- movement of plant food in, (41) 214.
- muck, *see* Muck soils.
- muskeg, culture experiments, (41) Minn. 387.
- mycobacteria in, studies, (44) 622.
- nature and properties, treatise, (47) 317.
- neutral, as neutralizers of sodium carbonate, (42) Calif. 811.
- nitrates in, *see* Nitrates.
- nitrification studies, (43) Pa. 515.
- nitrifying bacteria in, isolation, (43) 216.
- nitrifying power, relation to plant growth, (47) 215.
- nitrogen content, *see* Ammonification, Nitrification, and Nitrogen.
- oasis, from the Sahara desert, analyses, (42) 121.
- of Africa, pH values, (50) 420.
- of Alps, protozoan content, (47) 724.
- of Argentina, analyses, (46) 423.
- of Arkansas, analyses, (49) Ark. 809.
- of Arkansas, fertilization, (44) 720.
- of Assam, studies, (50) 717.
- of Barbados, origin, (44) 510.
- of Bavaria, classification, (43) 513, 622.
- of Bengal, studies, (50) 14.
- of Bihar, phosphatic depletion, theory, (49) 815.
- of Blakeney Point, studies, (49) 417.

Soils—Continued.

- of Brazil, and protozoa, (50) 517.
- of Bulgaria, composition, (46) 423.
- of Burma, lime absorption by, (43) 27.
- of California, studies, (42) Calif. 811.
- of Camden area, composition, (45) N.J. 211.
- of Cape Province, (45) 115.
- of Carmel Valley, pH of, (46) 26.
- of central Florida, (46) 213.
- of central Wisconsin, treatment, (48) Wis. 717.
- of Ceylon, analyses, (49) 617.
- of Chautauqua Co., composition, (46) N.Y.State 423.
- of Cochin China, (42) 716.
- of Darrang District, composition, (50) 419.
- of De Kalb Co., fertilizer requirements, (47) Ill. 721.
- of Delaware, fertilizer and lime requirements, (41) Del. 130.
- of Delaware, improvement, (45) Del. 622.
- of Denmark, lime requirements, (50) 724.
- of Detroit area, (43) Mich. 622.
- of eastern Germany, (43) 320.
- of eastern Virginia, use, (47) U.S.D.A. 318.
- of Egypt, bacteriological activity, (44) 813.
- of Egypt, biological studies, (41) 812; (48) 813.
- of Egypt, leveling, (42) 577.
- of Egypt under flooding irrigation, (50) 512.
- of England, (50) 418.
- of Eritrea, analyses, (43) 721.
- of Essex, lime requirement, (41) 724; (46) 521.
- of Europe, cobalt and nickel in, (48) 19.
- of French Antilles, analyses, (44) 670.
- of Georgia, analyses, (41) 317, 318, 512, 718; (42) 217; (46) 17, 712.
- of Georgia, fertilizer formulas, (43) 727.
- of Georgia, Floyd Co., analyses, (50) 814.
- of Georgia, Madison Co., analyses, (49) 116.
- of Georgia, Pierce Co., analyses, (47) 513.
- of Goa in Portuguese India, (49) 16.
- of Greece, fertility studies, (47) 121.
- of Guam, (42) 16.
- of Hagerstown, analysis, (49) 617.
- of Hawaii, acidity, nature of, (50) 619.
- of Hawaii, analyses, (46) 815.
- of Hawaii, flora of, (41) 217.
- of Holland, formation by silting, (42) 420.

Soils—Continued.

- of Illinois, fertilizer requirements, (44) Ill. 720.
- of Illinois, McHenry Co., studies, (47) Ill. 18.
- of Illinois, Peoria Co., (46) 315.
- of India, analyses, (41) 621; (42) 512.
- of India, biological studies, (41) 720, 811, 816.
- of India, classification, (41) 621.
- of India, fertilizer requirements, (41) 515, 813, 814, 816.
- of India, lime requirements, (41) 515, 816.
- of India, pH values, (48) 811.
- of India, studies, (41) 719, 720; (46) 714.
- of Indian tea districts, (41) 718.
- of Indiana, analyses, (43) 419.
- of Indiana, fertilizer requirements, (41) Ind. 218.
- of Indiana, legumes for, (41) Ind. 19.
- of Iowa, fertilizer experiments, (42) 516.
- of Iowa, fertilizer requirements, (47) Iowa 721.
- of Iowa, lime requirement, (42) 516.
- of Iowa, liming, (41) Iowa 24.
- of Iowa, reclamation, (43) Iowa 21.
- of Italian colonies, (41) 621.
- of Italy, (46) 215; (48) 814.
- of Italy, improvement, (42) 813.
- of Italy, reaction, (48) 811.
- of Java, analyses, (43) 320.
- of Java, mechanical tillage, (48) 684.
- of Kansas, lime requirement, (47) 324.
- of Kansas, sulphur in, (49) 22.
- of Kentucky, phosphates for, (45) 728.
- of La Jaille, analyses, (43) 621.
- of Louisiana, analyses, (44) La. 619.
- of low calcium content, studies, (43) Ky. 814.
- of Lower Burma, phosphate requirements, (42) 220.
- of Mariut district, Egypt, (46) 816.
- of Maryland, analyses, (43) Md. 122.
- of Maryland, fertilizer requirements, (43) Md. 122, 815; (47) Md. 418.
- of Michigan, classification, (41) 620.
- of Michigan, lime requirements, Mich. (47) 625; (48) 623; (49) 215.
- of middle Niger River, analyses, (49) 616.
- of Minnesota, (41) 212, 512.
- of Minnesota, glacial, composition and origin, (42) 809.
- of Mississippi, (41) 621.
- of Missouri, manual, (46) Mo. 511.
- of Montana, analyses, (50) Mont. 209.
- of Montana, causes of infertility, (49) Mont. 116.
- of Montana, Sheridan Co., physical survey, (50) Mont. 209.
- of Morocco, analyses, (43) 513.
- of mountain prairies, fertilizer requirements, (41) 722.

Soils—Continued.

- of Murrumbidgee irrigation areas, (48) 421.
- of Nebraska, (44) 619, 692.
- of Netherlands, manganese in, (50) 514.
- of New Brunswick, lime requirements, (43) 623.
- of New Hampshire, lime requirements, (49) N.H. 323.
- of New Jersey, Belvidere area, (47) N.J. 416.
- of New Jersey, protozoan fauna, (43) 217.
- of New Zealand, analyses, (41) 621.
- of North Carolina Coastal Plain, analyses, (43) 419.
- of North Carolina, fertilizer experiments, (43) N.C. 424.
- of North Carolina, lime requirements, (43) 420.
- of North Carolina, phosphate requirements, (43) 816.
- of North Wales, studies, (41) 811.
- of Northern Wisconsin, (43) Wis. 622.
- of Nova Scotia, analyses, (41) 811.
- of Ohio, (43) 486.
- of Ohio, organic phosphorus content, (43) 813.
- of Ohio, peat and muck, (41) Ohio 212.
- of Oregon, analyses and fertilizer requirements, (42) Ore. 811.
- of Oregon, studies, (44) Ore. 719.
- of Oregon, sulphur-oxidizing capacity, (48) 723.
- of Otago Peninsula, analyses, (50) 815.
- of Ozark region, studies, (50) Mo. 15.
- of Pennsylvania, lime requirement, (44) Pa. 20.
- of Peru, analyses, (43) 720.
- of polder and lake beds in Holland, studies, (45) 325.
- of ponds and lakes, studies, (48) 615.
- of Porto Rico, ammonification and nitrification, (44) 814.
- of prairies, moisture content, (41) 514.
- of Pulawy, morphological studies, (49) 116.
- of Quebec, analyses, (41) 318.
- of Quebec, pH values, (50) 513.
- of Queensland, lime and magnesia content, (41) 718.
- of South Africa, lime requirement, (48) 19.
- of South Africa, management, (42) 515.
- of South Africa, nitrifying powers, (46) 516.
- of South Africa, protozoa in, (50) 518.
- of South Carolina, composition and origin, (42) 420.
- of Surinam, effect of tropical climate, (49) 511.

Soils—Continued.

- of Sweden, lime requirements, (43) 623.
- of Sweden, types, (50) 720.
- of Texas, chemical composition, (42) Tex. 121.
- of Texas, composition, (48) Tex. 512.
- of Texas, need for lime, (42) Tex. 121.
- of Texas, nitrification, (43) Tex. 724.
- of Texas, sulphur requirements, (48) Tex. 517.
- of the Sudan, analyses, (50) 316.
- of the Sudan, nitrification, (50) 816.
- of the Sudan, studies, (47) 721.
- of Transvaal, analyses. (46) 712; (50) 420.
- of Transvaal, nature of, (50) 815.
- of Transvaal, studies, (48) 812.
- of Union of South Africa, analyses, (41) 621.
- of Union of South Africa, studies, (45) 327, 328.
- of Upper Bavaria, studies, (48) 615.
- of Uruguay, analyses, (42) 328.
- of vicinity of Ottawa, (41) 419.
- of Washington, management, (47) Wash. 211.
- of West Indies, studies, (46) 815; (47) 513.
- of western Washington, management, (46) Wash. 215.
- of Willamette Valley, management, (46) Oreg. 214.
- of Wurttemberg, geological origin, (42) 16.
- organic—
 - and inorganic acids as affecting solubility, (41) Mich. 513.
 - classification, (49) Mich. 415.
 - matter in, *see* Organic matter.
 - phosphorus in, (49) 815.
 - rate of formation of soluble substances, (45) 22.
- origin of, (43) 719.
- oxygen-supplying power, determination, (50) 22.
- paddy, gaseous products of decomposition, (41) 720.
- paddy, green manure for, (43) 423.
- Palouse, management, (43) Idaho 814.
- pamphlet of popular information, (41) 813.
- pans in, formation, (48) 117.
- partially sterilized, microflora in, (45) 29; (47) 417.
- pasture, in Switzerland, flora and fertilizers, (49) 511.
- peat, *see* Peat and Moor.
- penetration by temperature waves, (41) 422.
- percolation studies, (42) 119.
- permeability, measurement, (42) 780.
- phosphates in, solubility, (46) 320.
- phosphoric acid determination in, (47) 20; (49) 203; (50) 118.

Soils—Continued.

- phosphoric acid fixation in, (42) Va. 424.
- phosphoric acid requirements, (46) 821.
- phosphoric acid requirements shown by plant analysis, (44) 816.
- phosphorus determination in, (43) 115.
- phosphorus requirements, determination, (49) 815.
- physical constants, (50) 14.
- physical properties, (43) 320.
- physical properties, relation to pH values, (50) 618.
- physical properties, relation to survey work, (48) 115.
- physical texture, relation to productivity, (41) 719.
- physicochemical studies, (46) 809; (48) 17, 115.
- physics of, (43) 122.
- plant nutrients in, determination, (46) 419.
- podsol, of Sweden, (44) 212.
- potash determination in, (50) 118.
- potash in, effect of cropping, (50) 118.
- potassium removal from, (46) N.Y. Cornell 210.
- pressure transmission through, (47) 389.
- productive power, determining, (49) 120.
- productive, treatise, (43) 719.
- productivity. restoration near zinc roasters, (43) 513.
- properties and maintenance, (43) 209.
- protozoa in, (48) 817.
- push, analyses, (43) Iowa 21.
- rawness of subsoil, (41) 322.
- reaction and lime requirement, (49) 619.
- red, in Mediterranean region, (44) 18.
- red, origin, (46) 621.
- red, origin and properties, (44) 212.
- relation to fertilizers, (41) 423.
- relation to forestry, (50) Mich. 419.
- relation to meteorological conditions, (42) 716.
- residual limestone in, (43) 115.
- retention of soluble phosphates in, (46) 121.
- rice, of Ceylon, studies, (49) 322.
- rich and poor in lime, phosphoric acid action on, (48) 427.
- rocky, dynamiting, (41) 624.
- rôle in nitrogen storage by high-altitude grasses, (41) Wyo. 333.
- rôle in vegetation of Avra Valley, (41) 220.
- rubber and coconut, Malayan, (41) 319.
- saline, of Madras Presidency, (41) 127.
- saline, reclamation in Punjab, (50) 209.
- sampling, (41) 124, 718, 810; (43) 210; (44) Ariz. 508, Pa. 717.

Soils—Continued.

- sampling, variation in, (42) Calif. 811.
- sandy, *see* Sandy.
- scarified, physical properties, (49) 210.
- sedimentation analyses, (46) 517.
- sedimentation curves, (46) 623.
- semiarid, determining alkali in, (42) Utah 813.
- sheraqui, of Egypt, (44) 124.
- "sick" treatment, (50) 521.
- "slick spots," (41) Idaho 18.
- smoke injury in, (44) 509.
- soda-containing, effect on plant growth, (42) 436.
- sodium carbonate formation in, Calif. (48) 515; (49) 318.
- sodium carbonate removal from, (49) Calif. 319.
- solubility, effect of calcium sulphate on, (43) 516.
- solubility under different conditions, (41) Mich. 512.
- soluble materials as affected by wheat and lime, (41) N.Dak. 124.
- soluble salt content, (47) 515.
- sour, modification, (49) R.I. 512.
- sour, qualitative test, (46) 615.
- sour, significance, (46) 811.
- sour, test for, (49) 407.
- specific gravity determination, (44) 801.
- specific surface, determination, (50) 86.
- sterile, plant growth in, (43) 422.
- sterilization, (41) 215, 515, 537, 623, N.J. 654; (42) 19; (43) 659; (44) U.S.D.A. 154; (45) 537, 538; (46) 641, Guam 715; (47) 120, 216, 637, 840.
- sterilization—
 - effect on bacterial activities, (49) 119.
 - effect on crops, (47) Ill. 830.
 - effect on seed germination, (41) 523.
 - for potato wart, (45) 146; (47) 544.
 - in greenhouses, (41) 339; (49) Ind. 540, Ind. 636.
 - in tobacco seedbeds, (41) 644.
 - methods, (42) 514.
 - partial, (42) 431, 718; (45) 328, 813; (47) 417.
 - partial by sodium arsenate, effect, (49) 515.
 - partial, effect on microbiological activities, (50) 620.
 - partial, significance, (49) 515.
- sterilized—
 - bacteriological and chemical examination, (49) Ind. 636.
 - effect on *Clostridium pastorianum*, (47) 319.
 - growth of bacteria in, (41) 812.

Soils—Continued.

- sterilized—continued.
 - microflora and nitrogen in, (45) 422.
 - use in phytopathological research, (47) 840.
- stony, effect on plant growth, (41) 813; (42) 423.
- stored, retention of vitality by algae in, (44) 521.
- structure as affected by potassium and sodium salts, (41) 519; (43) 516; (44) 422.
- studies, (46) Ky. 816; (47) N.Y. State 516; (48) Fla. 215, Mo. 615; (49) Mont. 116, Wash.Col. 209, 210, Guam 414, Iowa 723.
- studies in America, (44) 123.
- studies in Michigan, (49) 616.
- studies, neglected, (49) 616.
- studies, new processes, (46) 419; (47) 18.
- studies, principles, (46) 620.
- subgrade, studies, (45) 587; (50) 790.
- sugar cane, in Java, analyses, (42) 622.
- sugar cane, of French Antilles, composition, (45) 211.
- suitable for nitragin inoculation, (43) 217.
- sulphates in, determination, (47) 609.
- sulphur oxidation in, (47) 620, 621.
- sulphur removal from, (46) N.Y. Cornell 211.
- sulphur requirement, (42) 525.
- sulphur transformation in, (48) 516.
- sulphur-oxidizing power, (48) 422.
- summer fallow experiments, (49) Wash.Col. 209.
- sun-dried, legume bacteria in, (47) 216.
- swamp, *see* Swamp.
- swelling and shrinkage, studies, (49) 211.
- teaching, in agricultural colleges, (45) 90.
- thermal conductivity, effect of moisture, (48) 618.
- tillage experiments, (45) Wis. 423; (49) Wash.Col. 209.
- titanium determination in, (44) 210.
- tobacco, analyses, (41) Can. 832.
- tobacco, survey, (43) Can. 735.
- toxic properties, (49) 813.
- toxicity after heating, (41) 215.
- toxicity, measuring, (48) 812.
- toxicity of salts in relation to osmotic pressure, (46) 209.
- toxins in and bog xerophytes, (50) 627.
- toxins in, origin, (41) 624.
- transformation in, (45) 725.
- treatise, (43) 621; (49) 616.
- treatment, (48) 616.
- treatment for nematode control, (41) Fla. 548, 660, 846.

Soils—Continued.

- treatment for subterranean insects, (49) Wash.Col. 251.
- treatment for wireworm control, (41) N.J. 58.
- treatment in Rhodesia, (46) 817.
- tropical, nitrification and denitrification, (47) 214.
- tropical, studies, (41) 501.
- ultramicroscopic flora in, (46) 513.
- under continuous cultivation, effect of lime-magnesia ratio, (47) Va. 624.
- unfree water in, (45) 323.
- unlimed, oxidizing power, (44) 19.
- unproductive, of Italy, management, (41) 624.
- use of lime on, (43) 519.
- variability, significance in field trials, (41) 124.
- variation of soluble salts in, (46) 623.
- ventilation, (44) 620; (50) 719.
- virgin and cropped, (43) Mich. 622.
- virgin and cultivated, calcium and magnesium in, (42) 621.
- volcanic ash, fertilizer experiments, (44) Alaska 513.
- water adsorption and run-off, (41) Mo. 622, 686.
- water level as affected by canals and mines, (43) 210.
- water movement in, (49) 212.
- water movement in, formulas, (42) 422.
- water vapor movement through, (46) 811.
- water-holding capacity, (47) Calif. 618; (50) 316.
- water-logged, reduction potentials, (43) 421.
- water-supplying power of, (45) 527.
- weathered transported, correlation, (47) 210.
- weathering, hygroscopicity as measure, (41) 719.
- wild meadow, analyses, (42) 17.
- workability, effect of water content and void space, (45) 514.

Solanaceae, opening of anthers in, (43) 327.

Solanaceous grafts, studies, (47) 28.

Solanaceous plants, bacterial blight, (41) Fla. 542.

Solanin poisoning—

- review of literature, (43) 866.
- studies, (45) 862.

Solanum—

- bullatum as forage plant, (41) 533.
- carolinense, control, (44) Pa. 737.
- esuriale, feeding experiments, (48) 168.
- fendleri hybrid, studies, (41) 134.
- macrocarpum as food substitute, (46) 755.
- nodiflorum, use for greens, (42) 138.
- opacum, feeding experiments, (46) 674.
- triquetrum, notes, (45) 354.
- tuberosum, cytological studies, (44) 728.

Solar—

- activity variations, meteorological effects, (43) 810.
- radiation, *see* Radiation.
- variations, effect on climate, (44) U.S.D.A. 415.

Soldering, information on, (49) 290.

Soldier Settlement Act of Canada, (43) 93.

Soldiers, *see* Service men.

Solenite, use in agriculture, (45) 891.

Solenopotes capillatus, description, (45) 853.

Solenopsis—

- geminata, on avocados, (42) 546.
- molesta, notes, (46) 50; (48) 651.
- molesta, studies and synonymy, (43) Kans. 763.

Solidago, relation to locust borer activity, (46) Ky. 57.

Solidago spectabilis poisonous to livestock, (43) Nev. 273.

Solids, determination by gauze dish method, (50) 201.

Solutions—

- fundamental laws, relation to use of lime in agriculture, (49) 518.
- nutrient, *see* Nutrient.
- reaction change due to seeds, (50) 523.

Solvents—

- for fats, oils, waxes, and resins, (48) 807.
- immiscible, distribution of drugs between, (47) 15.
- volatile, recovery, (48) 804.
- water-miscible, for vitamin extraction, (50) 506.

Sore throat, septic, milk-borne epidemic of, (50) 79.

Sorex merriami, status of, (45) 452.

Sorghum—

- Amber, analyses, (45) 41.
- Amber, as summer forage, (41) Mo. 637.
- Amber, field tests, (41) N.Dak. 824.
- analyses, (42) 6; (47) Va. 823.
- and corn, relative water requirement, (50) Kans. 28.
- and soy beans as summer forage, (43) Mo. 736.
- as dry farm crop, (41) Ariz. 29.
- as forage crop, (44) Calif. 731; (45) U.S.D.A. 531; (46) Mass. 30; (47) N.Mex. 333.
- as silage and hay, (42) N.Mex. 36.
- as silage crop, (41) Kans. 34, Tex. 36; (42) U.S.D.A. 337; (43) Minn. 636.
- breeding experiments, (43) 637; (44) Kans. 224; (45) 734; (47) Okla. 824; (49) Tex. 429, 735.
- breeding for sirup, (47) Wis. 432.
- culture, (43) Ariz. 733; (44) Hawaii 30, Ariz. 523; (45) Wis. 228, N.Dak. 734.
- culture—
 - and uses, (44) U.S.D.A. 436.

Sorghum—Continued.

culture—continued.

- experiments, (42) N.Dak. 732.
- Minn. 735, Tex. 828; (43) U.S.D.A. 134; (44) Va. 732; (45) Kans. 32; (48) Ariz. 434; (49) 329, Tex. 429.
- experiments in Ontario, (41) 333.
- experiments in Sweden, (50) 735.
- for forage, (45) 41.
- for sirup, Wis. (43) 335; (44) 225.
- in Cyprus, (44) 137.
- in Guam, (42) Guam 31.
- in Morocco, (49) 595.
- in the Sudan, (45) 538.
- under dry farming, (49) Nebr. 527.
- diseases and pests, (44) U.S.D.A. 436.
- diseases, control, (43) Tex. 845.
- effect of seed selection, (42) Calif. 822.
- fertilizer experiments, (41) 814; (42) Ala.Col. 822; (47) Ark. 519, 732.
- fodder, analyses, (42) Minn. 735.
- fodder, feeding value, (47) N.Mex. 669.
- for fattening pigs, (45) 474.
- grain—
 - and fodder yields, (49) Kans. 427.
 - breeding experiments, (45) Okla. 431.
 - chemical studies, (45) Okla. 433.
 - culture, (44) U.S.D.A. 39.
 - culture experiments, (41) Mo. 637; (43) U.S.D.A. 330; (47) U.S.D.A. 330; (48) Calif. 527.
 - feeding value, (41) 367; (46) Tex. 365; (47) 279; (49) Okla. 464.
 - fertilizer experiments, (43) Okla. 32.
 - grades for, (46) 835; (48) U.S.D.A. 35.
 - new, White Yolo, (46) 835.
 - production in United States, statistical study, (49) U.S.D.A. 389.
 - project study outlines, (44) 596.
 - rotation experiments, (43) Okla. 32.
 - seed production, (48) N.Dak. 225.
 - seeding experiments, U.S.D.A. (46) 636; (49) 827.
 - shelling percentage in, (47) Tex. 434.
 - v. corn, feeding value, (45) Tex. 69; (47) 75, Tex. 473; (48) Tex. 169.
 - varieties for silage, (46) Kans. 435.
 - variety tests, (41) Mo. 637; (43) Okla. 32, U.S.D.A. 134, Okla. 137, Tex. 230, U.S.D.A. 329; (45) Guam 34; (46) Hawali 633, Guam 725; (48) U.S.D.A. 223; (49) U.S.D.A. 827.
 - yields, (45) Mo. 224.

Sorghum—Continued.

- growth in alkali soil, early, (42) Utah 28.
- hay, Red Amber, analyses, (45) Kans. 32.
- head smut, description, (43) Wash. 242.
- head smut, notes, (45) 545.
- improvement by hybridization, (47) 633.
- inheritance of seed coat color, (50) 431.
- insects affecting, (48) 650.
- juice, analyses, (46) Conn.State 312.
- kernel smut resistant varieties, (41) Kans. 48.
- leaves, temperature, (50) 425.
- mill refuse, digestibility, (44) 867.
- millet, fungus diseases, (47) 544.
- millet, insects affecting, (45) 853.
- Minnesota, sugar content, (42) 6.
- natural cross-pollination in, (49) Tex. 429.
- perennial, culture experiments, (45) 631.
- Phoma infected, (48) 547.
- Phoma insidiosa affecting, (50) 148.
- pomace for cattle, (45) 873.
- preparation for planting, (49) Tex. 429.
- propagation by cuttings, (41) 735.
- prussic acid content, (42) Fla. 829.
- prussic acid, poisonous to cattle, (46) 484.
- refuse, analyses, (41) Ariz. 367.
- rotation experiments, (49) Tex. 429.
- seed, digestibility and productive value, (47) Tex. 472.
- seeding experiments, (45) Kans. 32, Mo. 224; (49) Nebr. 733.
- sirup—
 - analyses, (42) Minn. 713.
 - calculating yield, (47) Wis. 410.
 - industry in Minnesota, (42) Minn. 735.
 - manufacture, (42) Minn. 713; (44) Ohio 117, 807.
 - manufacture, equipment, (46) 206.
 - smut, studies, (41) Mo. 654; (49) Okla. 542, 646.
 - smuts in Bombay Presidency, (41) 51.
 - statistics, (42) U.S.D.A. 731.
- sweet—
 - as forage crop, (45) Mo. 633.
 - growing with soy beans, (41) Mo. 637.
 - varieties for North Carolina, (43) 532.
 - variety tests, (43) Okla. 32.
- tannin in, (50) 615.
- temporary roots, (45) 41.
- v. corn, feeding value, (50) Tex. 66.
- v. corn for fattening lambs, (45) 471.
- v. corn, yields, (48) Mo. 628.
- v. Sudan grass for Ohio, (41) Ohio 234.
- varieties, description, (48) Guam 230.
- varieties, yields, (47) U.S.D.A. 430.

Sorghum—Continued.

- variety tests, (41) Idaho 225, Ariz. 332; (42) N.Mex. 36, N.Dak. 732, Minn. 735, Tex. 828; (43) U.S.D.A. 134, U.S.D.A. 330, La. 636, 637, Ariz. 733; (45) Kans. 32, Nebr. 531, 734; (47) Ark. 732, Nebr. 736, Okla. 824; (48) 434, Ariz. 434; (49) Guam 426, Miss. 428, Okla. 428, Tex. 429, Iowa 732, Nebr. 733, Fla. 824; (50) U.S.D.A. 132.
- vulgate, asal fly on, (41) 664.
- vulgate, brewing tests and utilization, (41) 641.
- water requirements, (45) Nebr. 531.
- waxy endosperm in, (47) 334.
- webworm, notes, (48) U.S.D.A. 52, 650.
- yields, (44) U.S.D.A. 228; (47) Calif. 631.

Sorghums—

- ants attacking, (43) Kans. 763.
- comparative tests, (45) Tex. 233.

Sorgo—

- culture experiments, (49) Mont. 430, U.S.D.A. 630.
- culture experiments in Sweden, (50) 735.
- improvement, (49) N.C. 733.
- juice, starch in, (50) 206.
- sirup, jellying, prevention, (50) 509.
- tannin in, (50) 615.
- variety tests, (48) U.S.D.A. 224, 434; (49) U.S.D.A. 630, Nebr. 733; (50) U.S.D.A. 132.

Sorosporaella uvella, studies, (42) 651.

Sorosporium reilianum, notes, (45) 545, 842.

Sorrel—

- African, as food substitute, (46) 755.
- African, source of acidity, (49) 713.
- poisonous to cattle, (45) 583.

Sotol as feeding stuff, (41) Tex. 70.

Soup and broth cubes, (41) 66.

Soup extracts, levulinic acid in, (46) 416.

Soup preparations and extracts, analyses, (41) 263; (43) Conn.State 859.

South American States, treatise, (46) 789.

South Carolina—

- College notes, (43) 799.
- Station, notes, (43) 799; (45) 499; (46) 796; (49) 299; (50) 398.
- Station, report, (42) 496; (44) 598; (46) 793; (48) 694; (50) 696.

South Dakota—

- College, notes, (41) 300; (43) 700; (44) 98; (47) 100; (48) 194, 600; (49) 198.
- Station, notes, (43) 200; (47) 100, 400; (48) 600.
- Station, report, (41) 299; (42) 899; (44) 698; (47) 497; (49) 599.

Sow thistle, control, (48) 36.

Sows—see also Pigs and Swine.

brood—

- alfalfa hay for, (41) N.Dak. 178.
- alfalfa v. Sudan grass for, (50) Kans. 68.

Sows—Continued.

brood—continued.

- barley v. corn for, (43) 774; (44) U.S.D.A. 771.
 - cost of wintering, Del. (41) 178; (44) 366.
 - feeding, (45) 676; (48) Iowa 572.
 - feeding and management, (48) Mont. 767.
 - feeding experiments, (41) Mo. 674; (42) U.S.D.A. 374; (43) U.S.D.A. 466, Pa. 572; (47) Minn. 374.
 - mineral requirements, (41) Kans. 73; (49) 871.
 - molasses for, (41) N.J. 73.
 - selection and management, (50) 777.
 - sunflower silage v. alfalfa hay for, (43) Mont. 69.
 - velvet beans for, (45) Guam 70.
 - winter and spring care, (42) Mich. 694.
 - winter rations, (42) Wis. 373; Ohio 871; (46) 874.
 - wintering, (47) Pa. 474, Ark. 776; (49) Oreg. 572; (50) Can. 470.
 - fertility and fetal atrophy, (47) 863.
 - immature, breeding, effect on growth, (46) Mo. 362.
 - maintenance and reproduction on grain diet, (44) 68.
 - musculation of Graafian follicle, (46) 483.
 - vaccination against abortion, (49) Ky. 581.
 - variations in farrow, (43) Ill. 571.
- Soy bean—
- and cowpea hay, comparison, (45) Mo. 224.
 - anthracnose, notes, (45) N.C. 443.
 - bacteria, nonspecific strains, (41) Ga. 130.
 - bacteria, sensitivity to acid, (42) Wis. 324.
 - bacteria, studies, (41) 735, 832.
 - bacterial blight, notes, (41) N.C. 656; (42) 352; (44) Wis. 241; (45) 545; (46) N.C. 740.
 - bacterial blight, seed transmission, (48) 453.
 - bacterial pustule, (48) 48.
 - bacterial spot, transmission, (47) Ind. 147.
 - blight, notes, (42) Nebr. 743; (44) 48.
 - blight resistant varieties, (44) 846.
 - cake, analyses, (41) Can. 565; (42) 770; (45) 775.
 - cake as substitute for peptone, (42) 334.
 - diseases, (48) Del. 643.
 - flour, characteristics and detection, (41) 467.
 - flour, nutritive value, (45) 664.
 - fungus diseases, (49) 844.
 - germination, effect on growth of nodule bacteria, (42) 25.

Soy bean—Continued.

- globulin, amino acids of, (45) 713.
- hay as affected by lime, (44) R.I. 335.
- hay, cost of production, (43) Ohio. 392.
- hay effect on milk production, (50) W.Va. 73.
- hay, effect on soil reaction, (46) 211.
- hay, feeding value, (50) 271.
- hay for pregnant ewes, (44) Iowa 471.
- hay, whole v. ground for lambs, (49) Iowa 773.
- leaf spot organism, tolerance to acids, (48) 644.
- leaves, ether extracts of, studies, (42) 411.
- leaves, temperature, (50) 425.
- meal—
 - analyses, (43) Ohio 377.
 - as corn supplement for hogs, (43) Ohio 377.
 - as wheat substitute, (42) 659.
 - composition, (41) 564.
 - digestibility, (42) N.Dak. 161.
 - digestibility coefficients, (48) 574.
 - feeding value, (41) Ky. 74, Mich. 74; (44) Del. 367; (47) 76, 782; (49) Ind. 573; (50) Ohio 171, Can. 470.
 - for chicks, (43) 674.
 - protein, nutritive value, (49) 865.
 - value in stock rations, (49) Ind. 772.
- milk, production, (49) 230.
- mosaic, notes, (45) N.C. 443; (46) 147.
- nodule bacteria, longevity, (44) Wis. 227.
- nodules, forms of nitrogen in, (46) 630.
- nomenclature, (48) 400.
- nutritive value in human diet, (42) N.Dak. 160.
- oil, analysis, (45) 719.
- oil, catalytic hydrogenation, (50) 610.
- oil, composition, (43) 610; (47) 711; (48) 607.
- oil, detection, (47) 311.
- oil, drying tendencies, tests, (42) 591.
- oil, identification, (44) 805.
- oil, increasing unsaturation, (41) 209.
- oil, losses in refining, (49) 311.
- oil, production, (46) 636.
- oil, sampling and examination, (43) 805.
- oil, studies, (45) N.Dak. 318.
- Phoma blight, notes, (45) N.C. 443.
- pod and stem blight, (50) 840.
- preparations, use in Japan, (45) 665.
- production, machinery for, (50) 98.
- products and their uses, (41) 209, 564.
- proteins, nitrogen in, (47) 201.
- proteins, nutritive value, (50) 267.
- proteins, soluble, preparation, (46) 356.

Soy bean—Continued.

- sauce, manufacture, (49) U.S.D.A. 311.
- seedlings, effect of pH, (48) Del. 26.
- seedlings, growth as affected by H-ion concentration, (43) 525.
- seeds, iron and manganese in, (49) 202.
- seeds, manganese in, (49) 731.
- seeds, sterilizing, (41) 735.
- starch, microphotograph of, (48) 708.
- tops, determination of acidity, (42) 505.
- urease. use in urea determination, (42) 204.
- yellow dwarf, notes, (46) 242.
- Soy beans—
 - abnormal growth in Shive's solution cultures, (41) 525.
 - acids in, relation to soil acidity, (42) 424.
 - adaptation and culture, (45) S.Dak. 536.
 - analyses, (41) Can. 565; (45) 872; (47) Va. 823.
 - and corn, feeding value, (50) Miss. 70.
 - and corn for silage, (44) R.I. 33, R.I. 335; (47) Ohio 634, Ark. 772.
 - and corn, hogging down, (48) Ky. 171, Mo. 665.
 - and cowpeas, comparative yields, (41) Mo. 637.
 - and other crops for hay, (43) W.Va. 139.
 - and sorghum as summer forage, (43) Mo. 736.
 - as affected by ammonium sulphate, (41) N.J. 27; (47) Mass. 218.
 - as affected by calcium, (46) Ky. 816.
 - as affected by fertilizers, (47) 531.
 - as affected by lime, (46) N.J. 534.
 - as affected by sodium nitrate, (44) R.I. 335.
 - as affected by sulphur, (46) Wash. 427, 428; (48) 723; (49) Ohio 625.
 - as chinch bug control crop, (49) Ill. 431.
 - as corn supplement for chicks, (42) 670.
 - as cover crop for peaches, (41) Del. 145.
 - as emergency hay crop, (49) Wis. 629.
 - as forage crop for pigs, (48) S.C. 665.
 - as green manure, (41) N.J. 19, N.J. 35; (42) Guam 31; (43) Md. 122, Mich. 639; (47) Miss. 217.
 - as hay and pasture crop, (45) U.S.D.A. 86.
 - as hay crop, (42) Mich. 631; (43) Mich. 639; (44) R.I. 335; (46) Mo. 326; (48) N.Dak. 226.
 - as orchard cover crop, (43) Pa. 538.
 - as short season hay crop, (47) Mich. 131.
 - as silage crop, (41) Mo. 334, 732; (43) Mich. 639; (47) Va. 823.

Soy beans—Continued.

Bacterium solanacearum on, (42) 352.
 breeding and selection, (43) Ind. 331.
 breeding experiments, (41) N.C. 638;
 (45) N.C. 430, 734; (47) Miss. 227;
 (48) P.R. 227; (50) P.R. 533.
 breeding for oil content, (43) N.C.
 434; (45) Wis. 226; (47) Wis. 431.
 Bulgarian, analyses, (48) 804.
 canning, temperature changes in, (45)
 U.S.D.A. 560.
 casein from, preparation, (45) 617.
 cost of production, (42) Mo. 188.
 cross pollination, (42) Wis. 338.
 culture, (46) Ky. 33; (47) Ill. 135,
 Mo. 230; (49) Miss. 222, Iowa 230.
 culture and expression of oil, (43) 240.
 culture and use in Uruguay, (45) 35.
 culture and uses, (45) Pa. 433.
 culture and value, (43) Ind. 234, Iowa
 235.
 culture experiments, (41) Tex. 35, 333,
 Mo. 637; (42) Tex. 828; (43) W.Va.
 139, Ind. 330, Ky. 331; (44) P.R.
 433, Ariz. 523, Oreg. 826; (45)
 Kans. 33, Guam 34; (49) Mont. 430.
 culture in Cuba, (44) 140.
 culture on sandy soils, (41) Wis. 18.
 description and agricultural value,
 (43) 528.
 detection in feeds, (50) 468.
 development as affected by aeration,
 (48) N.J. 328.
 disease-resistant varieties, (42) Nebr.
 744.
 drilling tests, (45) Ohio 126.
 effect of acidity on inoculation and
 growth, (45) Wis. 213.
 effect of crude petroleum on, (42) 435.
 effect of inoculation and lime, (42)
 531.
 effect of lime on nitrogen content, (42)
 N.J. 827.
 effect of position in pod, (41) N.J. 42.
 effect of prolonged daylight on growth
 and flowering, (49) Alaska 426.
 effect on following crop, Ohio (49)
 329, 724.
 effect on growth of chicks, (41) 75.
 effect on oxidation in soil, (47) 213.
 farm practices with, (44) 831.
 feeding value, (41) Ind. 70, 564; (42)
 369; (47) 76, Iowa 479; (49) Ind.
 571, 774; (50) Ohio 171, Ill. 675.
 fertilizer experiments, (41) Mass. 21,
 N.J. 23, Del. 136; (42) Mass. 326;
 (43) Ohio 726; (44) Del. 431; (45)
 Ohio 126; (47) 814.
 field tests, (41) N.Dak. 824.
 for fattening cattle, (43) Ind. 570.
 for North Carolina, (41) N.C. 434.
 for utilization of soil and greensand
 potash, (41) N.J. 24.
 germination as affected by fertilizers,
 (44) Va. 721.

Soy beans—Continued.

germination as affected by H-ion con-
 centration, (43) 525.
 germination as affected by organic sub-
 stances, (41) 523.
 germination, effect on nodule bacteria,
 (41) 735.
 germination, fertilizer injury to, (50)
 N.J. 216.
 germination tests, (44) 140.
 green clover worm on, (42) 649; (43)
 N.C. 450, 759.
 ground, as corn supplement for pigs,
 (43) Ohio 377.
 growth and composition as affected by
 length of day, (49) 739.
 growth and nodule formation, effect of
 pH, (47) 434.
 harvesting methods, (44) Wis. 227.
 hay yields, (43) Mo. 736.
 hogging down, (43) Ky. 374, 871; (46)
 Mo. 364; (49) La. 272.
 improvement, (49) N.C. 733.
 improvement in Manchuria, (50) 437.
 in Europe, treatise, (49) 230.
 in forage crop mixtures, (41) Mo. 637.
 in human nutrition, (48) 61.
 in water culture, equilibrium concen-
 tration, (41) 132.
 infection, relation to soil factors, (42)
 Nebr. 744.
 inheritance in, (50) 632.
 inoculation, (41) Ga. 130, 735, 832;
 (43) Mich. 698; (46) N.H. 328.
 inoculation, results, (47) N.H. 428.
 insects affecting, (50) Ohio 256.
 liming experiments, (41) Del. 136;
 (45) Ohio 126.
 lipolytic activity, (42) 707.
 manuring experiments, (45) Ohio 126.
 natural cross-pollination in, (49) 425.
 nitrogen content and yield as affected
 by lime, (48) N.J. 337.
 nodule formation by, (49) 35.
 nutrient requirements, (43) Md. 121.
 pedigreed strains, seed yield, (47) Wis.
 431.
 phosphate injury, (41) N.J. 27, 525.
 planted with corn, tests, (46) Iowa
 326; (47) Ohio 634; (48) Va. 333,
 S.C. 628; (49) Iowa 732.
 plowing and disking experiments, (46)
 Mo. 326.
 popular account, (43) U.S.D.A. 830.
 potassium and phosphorus utilization,
 (44) R.I. 335.
 productivity, relation to leaf area, (49)
 530.
 protein and oil in, (49) Ohio 308.
 returns from, in Georgia, (49) 90.
 rotation experiments, (41) Del. 136;
 (43) W.Va. 139, Ind. 234, Ohio 726;
 (44) Del. 431; (45) Ohio 126; (47)
 La. 428; (49) Ohio 725.
 salt requirements of seedlings, (48)
 N.J. 327.

- Soy beans—Continued.
 seed improvement, (47) N.C. 528.
 seed production, (43) Mo. 736; (48) N.Dak. 225.
 seed production maps, (41) U.S.D.A. 236.
 seeded in corn, effect on yield, (45) La. 223.
 seeding depths, (41) N.J. 42.
 seeding experiments, (41) Mo. 637; (43) W.Va. 139, Mo. 735; (45) Mo. 224; (46) Ky. 33; (47) Iowa 734; (49) Nebr. 733; (50) Minn. 133.
 selection for oil, (42) Wis. 338.
 soluble protein extract from, (46) 356.
 status of crop, (49) Ohio 333.
 steam-cooked, digestibility, (43) 564.
 sunburn and aphid injury, (48) Ariz. 451.
 time of harvesting, (43) W.Va. 139.
 treatise, (49) 35.
 urease content, (43) 10, 610, 802.
 use of soil potassium by, (43) 218.
 uses as food in China, (48) 360.
 utilization and by-products, (45) 113.
 v. cowpeas for pigs, (50) 471.
 varieties, (43) N.C. 434; (44) R.I. 335; (45) Pa. 433; (46) Mich. 633; (47) Ill. 135; (49) Iowa 230, Wis. 629; (50) Miss. 828.
 varieties—
 behavior, (48) Guam 228.
 for Iowa, (43) Iowa 235.
 for oil production, (44) 138.
 for silage, R.I. (46) 226; (47) 736; (49) 526.
 oil and protein in, (49) Ohio 334.
 variety for Idaho, (41) Idaho 225.
 variety tests, (41) Tex. 35, Del. 137, Ariz. 331, Mo. 637, N.C. 638; (42) Mich. 631, Minn. 731; (43) Okla. 32, Tex. 33, Md. 133, W.Va. 139, Ind. 234, Mich. 639, Ariz. 733, Mo. 735; (44) R.I. 31, R.I. 32, Wis. 226, Minn. 330, Iowa 432, P.R. 433, Minn. 732, Va. 732; (45) Ohio 126, La. 223, Mo. 224, Wis. 227, Md. 228; (46) Ky. 33, Hawaii 633, Guam 726; (47) Mich. 129, Minn. 130, Miss. 227, Minn. 333, La. 428, Ark. 733, Nebr. 736, Okla. 824; (48) Minn. 331, Minn. 332, S.C. 629; (49) Va. 134, Guam 427, Miss. 428, Nebr. 733, Ohio 733; (50) Minn. 133, V.I. 533, S.C. 637.
 variety tests for seed and hay, (49) La. 824.
 viability as affected by heat, (41) 430.
 white, amino-acid content, (41) 367.
 with minerals, feeding value, (48) 475.
 yields, (49) Pa. 223, La. 824.
 zinc content, (41) 464.
- Spalangia muscidarum*—
 life history notes, (48) 256.
 notes, (50) 359.
 texensis, notes, (45) 459.
- Spanish dagger, analyses, (44) Ariz. 568.
 Spanworms on cranberries, (47) Mass. 452.
- Sparganothis*—
 idaeusalis, notes, (46) 749; (49) 656.
 sp., notes, (43) 851.
 sulfureana, life history notes, (50) Mass. 659.
- Sparnopolius fulvus*, parasite on white grubs, (42) 549.
- Sparrow—
 hawk, economic position, (41) 454.
 house, food habits, (41) 454.
 trap, description, (45) 654.
 tree, proper name, (41) 250.
- Sparrows—
 English, in Michigan, (42) Mich. 694.
 English, injury to crops, (48) Hawaii 355.
 paper on, (42) 748.
- Spasmophilia and vitamins, (44) 63.
- Spathodea campanulata*, fungus attacking, (49) 652.
- Spavin, pathology of, (41) 82.
- Spectrophotometry in analysis, (43) 503.
- Spectroscopic titration for colored solutions, (42) 612.
- Spectrum, biological normal, (41) 428.
- Spelt—
 behavior in crosses, (46) 333.
 culture experiments, (47) U.S.D.A. 330.
 Fusarium blight, notes, (44) 243.
 varieties for Canada, (47) 823.
 wheat nematode attacking, (43) 751.
- Speltoid heterozygotes, spikelets on progeny of, (50) 27.
- Spermatogenesis—
 and oogenesis in sheep, (48) 566.
 in albino rats, (42) 376.
 in Blasia, (44) 427.
 in pheasants and Golden Campine cocks, (41) 472.
 marsupial, (50) 329.
 of aphids, (46) 246.
 of dogs, (43) 269.
 of domestic mammals, (43) 670.
 of the ringtail monkey, (48) 471.
 process of, studies, (42) 559.
- Spermatophytes in South America, new, (42) 224.
- Spermatozoa—
 excess in uterus, absorption, (44) 668.
 head length dimorphism of, (50) 730.
 in mammals, disinfection, (49) 683.
 of hogs, number and vitality, (47) Okla. 868.
 of horse, pH value, (49) Ky. 273.
 physiological studies, (47) 863.
 survival of motility, (46) 673; (47) 864.
 vitality, (47) Ky. 771.
- Spermophagus pectoralis*, notes, (45) 853.
- Spermophile, ovary, studies, (42) 667.
- Spermophilus citellus tridecemlineatus*, studies, (42) 667.
- Sphacella* sp., notes, (45) 843.

- Sphacelotheca*—
reiliana, notes, (43) Wash. 242; (45) 541; (50) 146.
sorghi, notes, (48) 743.
spp., notes, (50) 243.
(Ustilago?) cruenta, notes, (49) 839.
- Sphaerella*—
citri, notes, (43) 243; (44) 49.
gossypina, notes, (45) 649.
laricina, notes, (44) 347.
pomicola, notes, (42) 150.
rhododendri, description, (45) 547.
spp., notes, (47) 547.
- Sphaeria* *spp.*, notes, (47) 547.
- Sphaeroderma gossypii*, notes, (45) 649.
- Sphaerodithis neowashingtoniae*, notes, (45) 653.
- Sphaerolecanium prunastri*, notes, (43) 252.
- Sphaeronema*—
adiposum, notes, (46) 45.
fimbriatum, description, (44) 751.
fimbriatum, notes, (46) 551; (49) Miss. 441.
fimbriatum, utilization of glucose as source of carbon, (45) 354.
sp., notes, (48) 45.
sp. on rubber, (45) 550.
- Sphaerophoria cylindrica*, notes, (42) 854.
- Sphaeropsidales*, identification and classification, (45) Mich. 241.
- Sphaeropsis coccoina*, notes, (47) 547.
- Sphaeropsis malorum*, notes, (42) 742; (45) 842, 849; (46) 849; (47) 839.
- Sphaerostilbe*—
cocophila on grapefruit, (50) 752.
repens, notes, (47) 548, 754.
repens on mango roots, (46) 845.
repens on Para rubber, (42) 145.
- Sphaerothera humuli*—
control, (48) 145.
hops resistant to, (45) 543.
notes, (43) 446; (44) 151, 644; (48) 546.
treatment, (41) 751.
- Sphaerothera*—
mors-uvae, notes, (41) 49, 154; (43) 246; (44) 346, Oreg. 839; (46) 243; (47) 749.
pannosa, notes, (43) 152; (44) 750.
- Sphaerotrypes*, studies, (46) 560.
- Spaghnum* moss, source of energy for *Azotobacter*, (44) 814.
- Sphecidae* species, descriptions, (42) 550.
- Sphecus speciosus*, habits, (50) 359.
- Sphenomyia*, new genus, erection, (41) 259.
- Sphenophorus costicollis* n.sp., description, (42) 456.
- Sphenophorus maidis*, studies, (42) Kans. 855.
- Sphenoptera gossypii*, notes, (47) 46.
- Spherome* in asparagus, (45) 30.
- Spherome* in plant cells, (44) 822; (50) 223.
- Sphex vulgaris*, homing instinct in, (42) 860.
- Sphincter*, tonicity of, studies, (43) 180.
- Sphingidae* species, studies, (43) Ky. 359.
- Sphinx ligustri*, absence of complement in blood, (41) 754.
- Sphinx* moth, *Achemon*—
control, (46) 658.
in California, (49) 154.
- Spbryracephala hearseiana*, life history, (46) 856.
- Spicaria javanica* n.sp., description, (49) 255; (50) 249.
- Spice industry survey in India, (42) 444.
- Spices—
adulterants, detection, (42) 415.
analyses, (50) Conn.State 160.
analysis, official method, (44) 9.
culture in Fiji, (43) 40.
effect on *Clostridium botulinum*, (50) 366.
effect on molds, (45) 463.
methods of investigation and standards, (41) 558.
molds in, detection, (47) 314.
pests of, (45) 657.
preserving value, (42) 114.
substitutes for, (42) 458; (43) 204; (47) 612.
- Spiders—
British, treatise, (41) 455; (50) 260.
food consumption, (41) 463.
food, quantitative studies, (44) 356.
house, life history, (46) 161.
popular account, treatise, (49) 256.
- Spillways, siphon, summary of information, (43) U.S.D.A. 787.
- Spilocryptus*—
exannulatus n.sp., description, (42) 655.
propodeum n.sp., notes, (45) 459.
- Spilographa electa*, studies, (49) N.J. 356.
- Spilopodia*, studies, (45) 746.
- Spinach—
analyses, (43) 63.
antirachitic properties, (50) 771.
aphid injury, (41) Va.Truck 662.
aphid on potato, (41) 255.
as affected by carbon dioxid, (44) 218; (45) 834.
as affected by lime, (47) Md. 235.
as greenhouse crop, (44) Oreg. 834.
Bacillus botulinus A in, (49) Ill. 365.
blight, notes, Va.Truck (41) 663, 664.
blight, transmission by insects, (43) 547.
boom for spraying, description, (42) Va.Truck 893.
breeding, (46) 538.
canned—
adulteration with beet leaves, (46) 311.
Bacillus botulinus infection of, (46) 361; (49) 163.
bacterial flora, (46) 859.
canning, (47) 206.

Spinach—Continued.

- canning, effect of blanching in, (45) Mo. 260.
- canning, methods, (42) 113.
- carbohydrates, availability, (42) 457.
- culture, (44) Alaska 532; (50) 139.
- culture experiments, (44) Ariz. 532.
- damping off, (44) Conn. State 150.
- disease, new, (43) 544.
- diseases, notes, (41) 799, 843; (45) 649.
- downy mildew, notes, (49) Tex. 442.
- dried, antiophthalmic vitamin in, (50) 263.
- dried, bacteria and molds in, (48) 60.
- dusting experiments, (47) Va. Truck 236.
- effect of preceding crop, (46) R.I. 233.
- effect on following crop, (44) R.I. 33; (46) 336.
- fertilizer experiments, (44) R.I. 21; (47) R.I. 725; (49) R.I. 533; (50) N.J. 36.
- green peach aphid on, (50) Pa. 453.
- growth-promoting and antirachitic values, (50) 771.
- Indian, use for greens, (42) 138.
- iron content, (48) 159.
- leaf mold, control by spraying, (46) 45.
- lime requirements, R.I. (44) 32; (46) 233.
- long-distance shipment, U.S.D.A. (43) 144, (44) 836.
- manuring experiments, (50) R.I. 35.
- mildew, life history and control, (44) 646.
- mosaic disease characterized by nitrogen constituents, (44) 345.
- mosaic disease, studies, (45) 448.
- mosaic-resistant, breeding, (45) Va. Truck 847.
- nickel and cobalt in, (49) 520.
- nutritive value, (41) 557.
- protein, (43) 409.
- seed growing, (45) 44.
- substitutes, use for greens, (42) 138.
- sun-dried, vitamin B in, (43) 63.
- sun-dried, vitamins in, (46) 359.
- syrphid larvae on, (50) 156.
- varieties, (49) R.I. 533.
- variety tests, (44) Ariz. 532; (50) N.J. 36.
- vitamin A extraction from, (43) 165.
- vitamin, fat-soluble, in, (42) 556.
- vitamin, water-soluble, in, (42) 759.

Spinal cord of animals as food material, (43) 63.

Spindle tree as affected by chloropicrin, (45) 28.

Spirillum, associated with abortion in ewes, studies, (42) 570.

Spirochaeta—

- cytophaga n.sp., decomposing cellulose, (41) 632.

Spirochaeta—Continued.

- cytophaga, straw treatment with, (46) 217.
- icterohaemorrhagiae in the rat, (41) 85; (42) 545; (43) 883; (44) 849.
- icterohaemorrhagiae transmission by stable fly, (42) 751.
- morsus muris, studies, (42) 847.
- neotropicalis, proposed name, (47) 681.
- theileri, synonymy, (43) 82.
- Spirochaetales, subgroups and genera, (41) 821.
- Spirochetes—
 - as cause of infectious anemia, (43) 83.
 - equine, (45) 881.
 - in swine, (49) 182.
- Spirochetosis, bovine, in Brazil, transmission, (43) 82.
- Spirochetosis icterohemorrhagica, notes, (50) 253.
- Spirochetosis of fowls, (46) 778.
- Spirochetosis, venereal, in rabbits, (48) 183.
- Spirometer for calibrating gas meters, (44) 202.
- Spirospora castaneae and Acrospeira mirabilis, identity, (47) 541.
- Spittle insect on clover, notes, (45) Mich. 251.
- Spizella arborea, proper name for tree sparrow, (41) 250.
- Spleen—
 - changes in deficiency disease, (43) 664.
 - effect on respiratory metabolism, (44) 264.
 - insulin-like substance in, (50) 864.
 - juice, Leishman-Donovan parasite in, (47) 182.
 - tryptophan content, (45) 312.
 - zinc content, (45) 64.
- Splenitis in a duck, (44) 881.
- Spodoptera mauritia—
 - campaign against, (47) 357; (49) 155.
 - life history and control, (44) 353.
 - on rice, (42) 451; (46) 458.
- Spondias lutea, durability test of wood, (43) 44.
- Spondylocladium atrovirens—
 - notes, (42) 740; (44) 447; (45) 447; (46) 847; (48) 348; (49) 839.
 - treatment, (41) 748.
- Spongospora—
 - scurf, control, (49) 839.
 - sp. on potato, (41) 748.
 - subterranea, notes, (44) 447; (45) 447; (46) 847; (48) 348, 349; (49) 47; (50) 147, 550.
- Spore trap, automatic, (41) 153.
- Spores in the upper air, (49) 747.
- Sporobolus spp., analyses, (41) Wyo. 333.
- Sporocybe azaleae, description, (45) 547.
- Sporonema oxycocci, notes, Mass. (43) 155; (44) 848.
- Sporotrichosis, American and French, identity, (47) 882.
- Sporotrichosis, potassium iodid treatment, (41) 781.

Sporotrichum—

- carnis, notes, (50) 763.
- globuliferum, notes, (49) Nebr. 659.
- persicae n.sp., description, (45) 850.
- poae, notes, (49) 455.

Spotted fever, Rocky Mountain—

- monograph, (43) 60.
- transmission by rabbit tick, (48) 776.
- transmission by ticks, (49) 256.

Spotted fever tick, Rocky Mountain, *see* Dermacentor venustus.

Spray—

- application of fertilizers, Hawaii (41) 138, 148.
- formulas for potatoes, (44) 436.
- gun, effects of use, (44) 246.
- gun v. rod, (43) 842.
- gun v. rod and dust, (44) Oreg. 160.
- materials, studies, (46) Mass. 50.
- mixtures, chemistry of, (46) 501.
- mixtures, comparison, (47) 253.
- mixtures, compatibility, (45) 648.
- mixtures for fruit trees, (46) 851.
- mixtures for potatoes, (46) N.J. 548.
- mixtures, preparation, (47) Ohio 140.
- nozzles, Bordeaux v. disc, (43) Mo. 757.
- nozzles, studies, (41) W.Va. 290.
- practices in America, (50) 844.
- schedules, (42) 736, Ark. 736, Wash. 836; (43) Ohio 339, 743; (44) Mo. 535, Conn.State 836; (45) 44; (47) N.J. 140, Ohio 140, Wash. 140, 248, Mich. 441, U.S.D.A. 441; (48) 152, U.S.D.A. 252; (49) N.J. 138, Conn. State 534.
- schedules—
 - conference on, (44) 250.
 - for codling moth, (49) N.Mex. 154.
 - for Georgia, (43) 256.
 - spring and summer, (49) West. Wash. 97.
- strainer, description, (47) 592.

Sprayer, "four-horse," notes, (44) 252.

Spraying—*see also* Dusting and special crops.

- and dusting equipment, treatise, (49) 51.
- and dusting experiments, (44) Mich. 144; (45) 552; (48) Mich. 237, Can. 450; (49) 445.
- and dusting for Quebec, paper on, (42) 748.
- boom nozzle system, (47) 54.
- calyx spray, papers on, (47) 849.
- device, new, description, (47) Fla. 758.
- dormant, West.Wash. (48) 498; (50) 598.
- effect on transportation rots of fruits, (47) 152.
- experiments, (44) Oreg. 841; (45) 146; (47) Calif. 649.
- for weed control, (41) 537, 538, 737.
- In Hood River orchards, cost of, (44) 160.
- in India, (46) 544.
- leaf injury from, (44) 246.

Spraying—Continued.

- machinery and accessories, (47) 848.
- machinery, care, (41) 551.
- machines, tests, (41) N.J. 52.
- manual, (50) 440.
- materials, combinations, reactions from, (50) 346.
- outfits for hillside orchards, (47) Ohio 638.
- outline for fruit growers, (41) Mich. 43.
- papers on, (50) 844.
- relation to bees, (43) 662.
- safe and efficient, (46) 51.
- truck crops, booms for, (42) Va.Truck 893.
- v. dusting, *see* Dusting.
- value of casein spreaders, (47) Ark. 741.
- value of spreaders in, (49) 353.
- vegetable crops, (49) Va.Truck 233.
- Sprays—*see also* Insecticides, Fungicides, and specific kinds.
 - amount required on trees of different ages, (44) Oreg. 850.
 - and dips, relation to hard and alkaline waters, (48) 651.
 - as affected by rain, (43) 657.
 - Bordeaux v. lime sulphur, (45) 652.
 - comparison, (47) 48.
 - copper, *see* Copper.
 - effect on oranges, (47) 731.
 - film-forming, principles, (45) 852.
 - for downy mildew, studies, (41) 249.
 - for grape downy mildew, formulas, (48) 148.
 - for insect injury to green logs, (48) U.S.D.A. 52.
 - for Quebec orchards, (44) 52.
 - for tomato Septoria, tests, (44) 647.
 - fungicidal properties, (50) 346.
 - lacking copper, failure, (50) 446.
 - miscible oil, value, (47) 759.
 - mixed, for fruit trees, (47) 152.
 - orchard, formulas and equipment, (44) 536.
 - orchard, tests, (41) 657; (42) 746, Calif. 843, N.J. 849.
 - Pickering, adhesive properties, (43) U.S.D.A. 843.
 - Pickering, formulas, (43) U.S.D.A. 843.
 - preparation, (47) Mich. 441, U.S.D.A. 441; (50) Oreg. 834.
 - preparation and application, (49) 540.
 - spreading agents, (43) Oreg. 756; (49) 51.
 - spreading quality, (44) N.J. 349.
 - summer, comparison, (49) 235.
 - value, (46) 447.
 - without copper, results, (47) 546, 750.
- Springs—
 - classification, (42) 574.
 - contamination and protection, (43) 392.
 - flow of, measurements, (45) 687.
 - temperature of, (43) 321.

Spruce—

- as nurse crop, (49) 743.
- bacterial tumors, (47) 50.
- bark borer, six-toothed, (47) 258.
- black, witches' broom, (45) 541.
- blue, diameter growth, (45) 240.
- budworm—
 - estimate of damage by, (49) 50.
 - in Canada, (47) 761; (49) 154.
 - in Minnesota, (49) 254.
 - in New Brunswick, (46) 56.
 - in Quebec, (48) 252.
 - new parasite of, (48) 158.
 - notes, (43) 852; (44) Me. 163 Mich. 163, 742.
 - outbreaks, (50) 844.
 - survey, (46) 51.
- budworms, eastern, in the West, (50) 756.
- cones and seed, insects infesting, (47) 551.
- culture experiments, (48) N.Dak. 239.
- Douglas, value for shelter belts, (49) 240.
- dying, in Minnesota, (49) 254.
- forests, nitrification of soil, (41) 125.
- fungi injurious to, (42) 50.
- future yields in Canada, (42) 445.
- gall aphid, notes, (50) Conn.State 50.
- graft on pine, (41) 47.
- growth and reproduction on hardwood lands, (41) 47.
- growth as affected by locality, (43) 748.
- industry, handbook, (42) 349.
- insects affecting, (50) 153.
- leaf miner, notes, (50) 151.
- measurement, form-point method, (41) 47.
- mite, life history notes, (50) Conn. State 50.
- pollen distribution, (41) 46.
- Production Division, history, (43) 544.
- pulp bleaching, chlorin required, (47) 207.
- red, mycorrhizas on, (48) 725.
- red, root development, (48) 42.
- redwood and whitewood, relative strength, (46) 888.
- root habit, (41) 634.
- seedlings as affected by temperature, (48) 240.
- Sitka, properties, (49) 790.
- Sitka, uses, growth, and management, (47) U.S.D.A. 443.
- species for pulp-wood production, (45) 442.
- stem girdle, control, (50) 150.
- tests at Avondale, (49) 744.
- time of planting test, (48) 240.
- tortrix, notes, (46) Mich. 457.
- uses and stresses, (44) 149.
- white, distribution and habits, (50) 344.
- white, growth in Adirondacks, (50) 646.

Spruce—Continued.

- white, soda and sulphate pulps from, (46) 617.
- white, wood analysis, (42) 7.
- windfall injuries, (46) 645.
- witches' broom, notes, (45) 548.
- wood, white, hydrolysis products, (50) 8.
- yield tables, (43) 840.
- Sprue, etiology, (41) 562; (47) 371.
- Sprue treatment, (47) 770.
- Spurge, leafy, dissemination, (48) 338.
- Spurge nettle seeds, analyses, (50) 610.
- Spurry, culture, (44) Alaska 522.
- Squabs, composition of flesh, (50) 196.
- Squash—
 - aphids, control, (45) Mich. 258.
 - bacterial wilt, control, (43) U.S.D.A. 245.
 - beetle, life history and habits, (50) Va. 759.
 - beetle, notes, (42) 252.
 - beetle on watermelon, (47) 253.
 - borer, notes, (42) 647.
 - bug, control, (41) N.Mex. 159; (43) 757; (49) Wis. 653.
 - bug in Massachusetts, (48) 853.
 - bug, life history and control, (44) 548.
 - canned, bacterial flora, (46) 859.
 - Hubbard, improvement, (46) Vt. 138.
 - improvement, (45) 834.
 - in water culture, equilibrium concentration, (41) 132.
 - inheritance in, (48) 535; (49) 822.
 - insects affecting in Connecticut, (42) Conn.State 648.
 - mildews, control, (42) Guam 38.
 - seed globulin, comparison with cantaloup seed globulin, (49) 714.
 - seed oil, composition, (42) 311.
 - seedlings, absorption of calcium salts, (41) 221.
 - seeds, effect on animal metabolism, (45) 672.
 - summer, shape inheritance in, (49) 629.
 - wilt, studies, (43) Tex. 846.
- Squashes—
 - breeding, Minn. (42) 834; (44) 739; (47) 338.
 - culture, (49) Mont. 136.
 - culture experiments, (48) V.I. 340.
 - pruning experiments, (44) Mont. 337.
 - rotation experiments, (41) R.I. 434.
 - self-pollination studies, (49) 137.
 - storage tests, (43) 644.
 - variety for Alaska, (44) Alaska 532.
 - variety tests, Minn. (42) 835; (50) 138.
 - vitamin, fat-soluble in, (42) 556.
- Squirrels—
 - activities as affected by climatic conditions, (46) 555.
 - control, (43) Wash. 350.
 - fox, notes, (42) 748.
 - ground, in California, (41) 353.

- Squirrels—Continued.
 ground, life history, (44) 849.
 ground, plague eradication, (43) 850.
 ground, susceptibility to strychnin.
 (46) 655.
- Squirrel-tail grass—
 analyses, (41) Wyo. 333.
 injury to sheep, (41) Nev. 782.
 poisonous to livestock, (50) 78.
- St. John's wort, toxic effect on livestock,
 (43) 380; (44) 275.
- Stable fly—
 Habronema microstoma in, (48) 284.
 life history and habits, (46) 661.
 overwintering, (48) 157.
 relation to—
 anthrax, (41) La. 461.
 fowl cestodes, (41) 881.
 hog cholera, (41) 578.
 infectious anemia, (42) 678.
 infectious jaundice, (42) 751.
 studies, (43) U.S.D.A. 362.
- Stables—
 construction in Mexico, (43) 290.
 dairy, improvement of, (42) 489.
 design and construction in France,
 (42) 590.
 ventilation, fundamentals, (45) 489.
- Staggers—
 in livestock, cause, (49) 178.
 of cattle in Natal, (46) 776.
 or pushing disease in Natal, (48) 85.
 or shivers in livestock, (47) 486; (50) 480.
- Stagonospora—
 graminella, description, (49) 445.
 infossa n.sp., description, (49) 445.
- Staining, differential, of fungus and host
 plant, (43) 444.
- Stairways of rural habitations, (44) 287.
- Stalk borer—
 in South Dakota, (43) 850.
 notes, (43) Conn.State 251; (49) Iowa 757.
- Stallions—
 cured of dourine, carriers of trypano-
 somes, (44) 583.
 enrollment, Ind. (44) 774; (46) 768;
 (49) 273.
 in Indiana, (41) Ind. 178.
 in Oklahoma, (42) Okla. 561.
 registration and licensing, (43) Ind.
 269, Kans. 674; (45) Okla. 674;
 (50) Kans. 71.
- Standard of living in diversified farming
 section, (50) N.Y.Cornell 294.
- Standardization and inspection service in
 California, (47) 894.
- Standing, increase in metabolism during,
 (42) 167.
- Staphylococci, toxicity of various dyes for,
 (41) 474.
- Staphylococcus—
 acridicida n.sp., description, (48) 154.
 albus as affected by potassium mercuric
 iodid, (44) 275.
- Staphylococcus—Continued.
 albus, notes, (43) 472.
 aureus, growth, effect of vitamin B,
 (46) 80.
 aureus, value of chloramin T against,
 (44) 476.
 cremoris-viscosi n.sp., description, (44) 676.
 pyogenes albus, notes, (46) 777.
 pyogenes aureus and botryococcus,
 identity, (43) 181.
 pyogenes aureus, notes, (45) 588.
 pyogenes aureus, stainability, (44) 675.
 spp. in meconium of calf, (43) 183.
- Star apple, culture experiments, (48) V.I.
 340.
- Star grass, culture in Africa, (46) 232.
- Star scale on citrus, (43) 555.
- Starch—
 absence in evergreen leaves at low
 temperatures, (43) 29.
 action of diastatic enzymes, (42) 609.
 action of enzymes on, (41) 409.
 action of ptyalin on, (41) 614.
 adsorption in solution and at inter-
 faces, (47) 802.
 and phosphoric acid, compound, (45) 204.
 as affected by milk diastase, (47) 503.
 chemistry of, (41) 614, 801; (42) 409.
 composition, (41) 202; (50) 505.
 content, determination in presence of
 polysaccharids, (49) 309.
 determination, (45) 12; (50) 312, 313.
 digestibility in feeding stuffs, (47) Tex.
 471.
 digestion by diastase, (42) 310.
 effect of sulphates and chlorids, (47) 128.
 effect on geotropic behavior in plants,
 (42) 728.
 fermentation, biochemistry of, (42) 708.
 fermentation, gas production, (44) 308.
 foreign, in flour, detection, (46) 807.
 from arrowroot, (44) 634; (48) 630.
 from Arum, (41) 117.
 from cassava, (48) 630.
 from corn, (48) Hawaii 368.
 from Hawaiian root crops, Hawaii
 (48) 310, 368.
 from potatoes, (42) 275; (44) 140.
 from rice, (46) 508.
 gel, preparation and properties, (45) 219.
 grains, size, relation to flour strength,
 (50) 712.
 hydrolysis—
 by amylases, effect of organic
 compounds, (49) 10.
 effect of amino acids, (43) 311;
 (45) 109; (46) 707, 708; (48) 804; (50) 611.

Starch—Continued.

hydrolysis—continued.

effect of aspartic acid and asparagin on, (42) 203.

effect of lysin, (48) 608.

in corn, (45) 416.

in corn silage as affected by fermentation, (43) 502.

in plant tissues, determination methods, (48) 805.

in sorgo juice, (50) 206.

industries, 1914 to 1919, (44) 714.

industry, present status, (46) 308.

manufacture, handbook, (41) 417.

mobile, in plants, and geotropism, (50) 127.

soluble, formation by mold fungi, (42) 628.

soluble, gold number determination, (43) 12.

solution, making and preservation, (42) 11.

sources, preparation and uses, treatise, (49) 503.

storage in pear and apricot trees, (50) 835.

substitutes in Germany, (43) 204.

v. dextrin in nutrition of tadpoles, (41) 469.

values and energy values, (43) 372.

Starches—

combined fat in, (44) 111; (45) 611.

hemicellulose content, (50) 310.

new microphotographs, (48) 708.

raw, digestibility, (49) 660.

treatise, (42) 224.

Starchy concentrates, digestibility, (47) Tex. 472.

Starfish—

ground, effect on soil acidity, (47)

R.I. 519.

meal, analyses, (43) 868.

use as fertilizer, (47) 420.

Starlings, economic value, (41) 454; (44) U.S.D.A. 547; (47) 550.

Starlings, food habits, (47) 356.

Starters, volatile and total acidity in, (47) Iowa 381.

Starvation—

chronic, effects, (48) 61.

diets, effect, (50) 562.

effect on healing of rickets, (47) 566.

of insects, effect on offspring, (50) 732.

State Plant Culture Committee, Danish, report, (50) 28.

States Relations Service—

editorial, (49) 1.

annual report of director, (50) 3.

notes, (42) 398; (43) 100.

Statice rust, notes, (46) 844.

Statistical reporting service—

organization, (47) 298.

program, (46) 596.

Statistics—see also Agricultural statistics. elements, treatise, (45) 299.

Staloliths of wheat haulm, (44) 728.

Stauronotus maroccanus, outbreaks, (46) 657.

Stauropus alternus, life history, (47) 358.

Steam—

as bedbug eradicator, (42) 358.

disinfectors for destruction of lice in clothing, (42) 750.

effect on germs in milk cans, (49) 277.

effect on plants, (46) 544.

power plant, auxiliary equipment, treatise, (47) 888.

power plants, waste hot water from, use, (48) 818.

power v. electricity for dairy operation, (49) 84, 85.

pressure method for removing water from peat, (48) 815.

superheated for prevention of sugar deterioration, (44) 115.

Stearin, distillation with mannitol, (42) 757.

"Steek" grass, harmful effects on sheep, (41) 873.

Steel—

and concrete, bond between, (42) 486.

and timber bridges, design, (44) 85.

bridges, design and construction, (42) 486.

fence posts, (43) Ohio 391.

industry, by-products, value, (44) 725.

rustproofing, metallic coatings for, (48) 784.

structural, handbook, (47) 89.

structural, value of paint on, (43) 283.

Steers—see also Cattle.

alfalfa v. clover hay for, (43) Ind. 870.

body measurements, Pa. (43) 570; (44) 768.

changes in chemical composition on different rations, (48) Mo. 474.

changes in form and weight on different rations, (46) Mo. 66.

changes in proportions of carcass and offal on different rations, (48) Mo. 472.

composition as affected by condition, (44) 570.

composition at various stages of growth, (41) 367; (44) Minn. 569.

corn silage for, (43) Ind. 375.

cost of production, (42) N.H. 65; (49) Ind. 267.

cottonseed products for, (45) Ariz. 873.

dairy, raising, (49) Ohio 676.

dehorning and branding, chute for use in, (49) 87.

digestion experiments, (48) N.Dak. 69, N.Mex. 267; (49) 868.

effect of finish on rib cuts, (42) 867.

effect of wintering on pasture gains, (48) 398; (49) 167, 867; (50) Kans. 65.

elevator screenings for, (43) Can. 672.

fasting, urinary sulphur, (49) 370.

Steers—Continued.

- fattening, (44) Oreg. 176.
- fattening for market, (44) Ariz. 268.
- fattening, gains and measurements, (44) Pa. 768.
- feeding—
 - experiments, (41) Ind. 68, Fla. 566, Can. 567, Mo. 673, 769; (42) Mo. 65, Nebr. 168, Kans. 371; (43) U.S.D.A. 172, Ky. 373, Pa. 569, Ind. 570, Mont. 770, Can. 771, Ind. 868, Ind. 869, Ky. 869; (44) U.S.D.A. 176, Ariz. 268, Wis. 268, Wash. 471, Idaho 671, Kans. 769, Tex. 868; (45) W.Va. 69, 96, Mo. 268, Wis. 268, U.S.D.A. 268, Okla. 375, U.S.D.A. 469, 470, Wyo. 470, Nebr. 574, Idaho 674, Can. 873; (46) Ky. 71, Oreg. 169, Tenn. 169, N.C. 269, Mo. 364, Kans. 366, Ky. 367, Ind. 476, Wyo. 676; (47) 75, Wyo. 170, Wyo. 174, 279, Minn. 374, U.S.D.A. 470, Pa. 471, N.Mex. 669; (48) S.C. 69, S.Dak. 70, Ky. 169, Oreg. 169, Mich. 268, 370, Ky. 371, Mich. 371, Calif. 569, Idaho 569, Ohio 663, Ohio 670; (49) Ind. 267, Miss. 267, Pa. 268, Miss. 465, Wis. 670, Ohio 773, 867, 868, Miss. 869, 870; (50) Can. 269, Can. 368, Tex. 775, Pa. 869.
 - experiments on cane plantation, (48) 369.
 - experiments, reported by feed unit method, (44) 671.
 - in Colorado, (48) 767.
 - in South, (47) 374.
- finishing, (42) Va. 470; (43) N.Mex. 374.
- finishing, pasture v. barn, (43) Ky. 373.
- grazing experiments, (45) N.Dak. 268.
- growth curves, (50) Mo. 466.
- growth, effect of winter rations on, (45) U.S.D.A. 69.
- high moor v. low moor hay for, (44) 71.
- metabolism experiments, (50) 670.
- molasses for fattening, (44) 672.
- nitrogen metabolism of, (42) 470.
- of different ages, utilization of feed, (49) N.Mex. 868.
- on pasture, effect of cottonseed meal, (50) Miss. 65.
- on summer pasture in the South, (41) U.S.D.A. 565.
- passage of feed residues through, time required, (41) Va. 176.
- pasturing experiments, (43) N.Dak. 374.
- pea straw for, (43) 870.
- range, grazing experiments, (41) 435.
- roughages for, comparison, (49) Iowa 773.

Steers—Continued.

- shelter and warm water for, (46) Oreg. 170.
- silage for, (41) S.Dak. 567.
- sorghum pomace silage for, (45) 873.
- velvet bean pasture for, (41) Fla. 566.
- wheat straw for, (45) Kans. 267.
- winter feeding, (42) 560; (43) Nebr. 672.
- wintering and summer fattening, (49) N.C. 772.
- yearling, pasturing and wintering, (49) Miss. 466.
- Steganoptycha pinicolana* on larch, (48) 357.
- Steganosporium argentinense* n.sp., description, (49) 445.
- Stegomyia*—see also *Aedes* and *Mosquitoes*.
 - aegypti, notes, (46) P.R. 157.
 - calopus, feeding habits, (46) 248.
 - calopus, infection experiments, (41) 851.
 - control, (41) 553.
 - earliest name, (46) 661.
 - fasciata, effectiveness of *culicifuges* against, (41) 554.
 - fasciata, studies, (42) 251.
- Stem rust—
 - biologic forms, morphologic identity, (49) 748.
 - black, control, (50) Wis. 649.
 - conditions affecting, (47) Nebr. 750.
 - overwintering and origin, (45) Can. 842.
- Stemonites splendens*, notes, (50) 42.
- Stemphyllium* in sugar solution, studies, (46) 206.
- Stenobothrus morio*, control in Russia, (49) 450.
- Stenocranus saccharivorus*, notes, (44) 159; (45) Okla. 453.
- Stenocranus*, synopsis of genus, (47) 255.
- Stenogryllus* sp., notes, (49) 550.
- Stenoma catenifer* on avocado, (41) 460.
- Stenozygum personatum*, notes, (41) 551.
- Stephanitis rhododendri*, notes, (48) 154; (49) 153.
- Stephanocleonus plumbeus*, notes, (50) 259.
- Stephanoderes hampei*, parasites of, (49) 255.
- Stephanoderes hampei*, studies, (45) 559; (46) 159.
- Stephanurus dentatus*—
 - causing paralysis in a sow, (41) 86.
 - description, (46) 83; (49) 787.
 - effect on coagulation of blood, (45) 477.
 - parasite of swine, (47) 86.
- Sterculia caribaea*, durability test of wood, (43) 44.
- Stereoautograph, use in forest surveys, (44) 46.
- Stereocomparator, use in forest surveys, (44) 46.
- Stereophotogrammetry, importance in forestry, (44) 46.

Stereum—

- gausapatum on oak, (43) 449.
- hirsutum on Eucalyptus, (47) 51.
- hirsutum, rôle in wilt of grapevines, (48) 149.
- purpureum, description, (42) 150.
- purpureum, fruiting bodies and control, (46) 451.
- purpureum, notes, (43) 246; (44) 346; (49) 845; (50) 353.

Stericta albifasciata on avocados, (42) 546.

Sterigmatocystis in sugar solutions, studies, (46) 206.

Sterigmatocystis nigra—

- acid fermentation, (50) 328.
- effect of potassium on physiological characters, (45) 28.
- effect of sodium chlorid, (50) 22.
- studies, (42) 727.
- toxicity of phenols for, (50) 245.
- utilization ratio of glucose and levulose, (43) 730.

Sterigmatocystis smut of figs, (41) 157

Sterility—

- cause in Prunaceae, (49) 221.
- causes and recognition, (45) 781.
- cyclic manifestation in Brassica sp., (49) 425.
- defective diet as cause, (41) 862; (46) 261; (49) 568.
- diseases causing, (50) 78.
- in animals, (49) Ky. 164, 273.
- in cattle, (41) Mich. 479; (50) 788.
- in domestic animals, etiology and therapeutics, (48) 481.
- in pheasant-Golden-Campine hybrids, (41) 472.
- in plants, studies, (41) 134, 223, 430.
- in rice flowers, cause, (50) 23.
- in swine, (50) 870.
- in wheat hybrids, (50) Me. 26.
- pathology of, (46) Mich. 482; (50) Minn. 182.
- studies in fruit breeding, (50) Minn. 130.

Sterilization—

- and disinfection, treatise, (46) 310.
- of female by spermatotoxin, mechanism, (48) 869.

Sterilizing agents, effect on plants, (46) 544.

Sternochetus (Cryptorhynchus) spp., notes, (42) 159.

Sterolin, new reactions for, (49) 410.

Sterols, new reactions for, (49) 410.

Stichococcus bacillaris, illumination for, (44) 520.

Stictocephala festina, notes, (42) Ariz. 357.

Stigmas, sensitive, behavior, (49) 220.

Stigmus fulvicornis, damage to floors by, (50) 664.

Stilbella flvida, notes, P.R. (44) 247; (46) 454.

Stilbum—

- flavidum, notes, (46) 647.
- nanum gossypina, notes, (45) 649.
- scabre n.sp., notes, (50) 42.
- sp., notes, (42) 150; (44) 750; (45) 653.

Stilpnotia salicis, notes, (44) 250, 252; (45) U.S.D.A. 153; (47) U.S.D.A. 58; (48) U.S.D.A. 52.

Stink bug, southern green, see Nezara viridula.

Stinkwort, eradication, (46) 138.

Stizolobin, hydrolysis, (42) 201.

Stock, see Livestock.

Stock foods, see Feeding stuffs.

Stocks—

- double, notes, (43) 31.
- Paradise, selecting and propagating, (43) 238.
- spring-flowering, varieties, (41) 448.

Stomach—

- bacterial content as affected by saliva, (46) 862.
- examiner, new, description, (42) 316.
- human, response to pastry, (44) 665.
- in rats, growth in weight, (42) 559.
- of children, emptying time, (48) 362.
- responses to foods, (41) 467, 857.
- spontaneous ulcer of, in livestock, etiology, (49) 679.
- worms in cattle and sheep, (41) 684.
- worms in goats, (46) 883; (49) Tex. 481.
- worms in sheep, (43) 278, 384; (45) 182, Can. 887; (46) 685, 883; (47) Okla. 85.
- worms in sheep, treatment, (42) U.S.D.A. 381; (43) Okla. 79; (45) Okla. 478; (48) 398, 882; (49) 77, Mich. 80, N.C. 787.
- zinc content, (45) 64.

Stomata—

- and hydathodes in Campanula, (46) 523.
- behavior of, (49) 422.
- degree of opening, (42) 334.
- guard cells, variations in osmotic concentration, (46) 631.
- in plants, behavior and efficiency, (45) 336.
- internal, in fruits, (44) 729.
- morphogenesis, (46) 322.
- of Rubus, effect of orange rusts, (50) 354.
- of Rumex, physiology of, (48) 828.
- relation to transpiration, (43) 131.
- studies, (41) 329, 429, 819.

Stomatitis—

- contagious pustulous, in sheep, (46) 484; (50) 585.
- in suckling pigs, (50) 878.
- of calves in Wisconsin, (49) Wis. 681.

Stomoxys as hosts of Sarcocystis of bovines, (47) 554.

Stomoxys calcitrans, see Stable fly.

- Stomoxys, effect of food on longevity and reproduction, (50) 456.
- Stone for road building, *see* Road materials.
- Stone screenings, use as fine aggregate for concrete, (49) 384.
- Stones in soil, effect on plant growth, (41) 813; (42) 423.
- Stoporala v. Eumyias, (41) 547.
- Storage—
 batteries, lead, for farm lighting plants, (42) 860.
 battery, charging, fuel requirement, (48) Mo. 681.
 bins, circular reinforced concrete, (43) 892.
 bins, grain pressure in, notes, (42) U.S.D.A. 187.
 cellars for Canada, (47) 489.
 cellars, plans and construction, (42) 590.
 houses for sweet potatoes, plans, (42) Tex. 787; (45) Del. 691.
 rooms, lighting for potatoes, (43) 436.
 rooms, underground, construction, (43) 691.
 temperature, effect on fruit, (47) 151.
- Storax production, American, (46) 341.
- Storerooms, fumigation with sulphur, (47) 156.
- Storms—
 and their course, detection, (43) U.S.D.A. 718.
 classification according to rain power, (49) U.S.D.A. 719.
 tropical, papers on, (44) U.S.D.A. 416.
- Stovaine, use in anesthesia, (44) 476.
- Stovès, coal, efficiency tests, (43) 592.
- Strangles—
 immunization against, (45) 686.
 notes, (41) 580.
 prophylaxis and treatment, (41) 577.
 serum for, (45) 787.
 serum, standardization, (48) 378.
 vaccination against, (44) 781.
- Strategus—
 quadrioveatus, *see* Rhinoceros beetle. spp., life cycle, (46) 251.
 titanus, notes, V.I. (44) 356; (45) 150; (50) 555.
- Straussia longipennis, notes, (49) 848.
- Straw—
 analyses, as indication of potash in soil, (49) 816.
 artificial manure from, (46) 217.
 cellulose, studies, (41) 202.
 chopped, insulating value, (44) 588.
 composition as affected by soil, (41) 422.
 effect on nitrate accumulation in soil, (42) 425; (46) 622; (47) Wash. 212.
 effect on soil, (43) Wash. 726.
 effect on soil processes, (46) 423.
 fertilization, injurious action, (46) 818.
- Straw—Continued.
 filters for sewage purification, (45) 793.
 from Volga region, composition, (50) 169.
 gas, experimental production, (42) 685; (47) 391; (50) U.S.D.A. 387.
 grades, (44) 229; (46) 30.
 hydrolysis, (49) 569.
 hydrolysis, effect on availability of nutritive material, (43) 267, 569.
 hydrolysis, theory and practice, (46) 203.
 hydrolyzed and untreated, composition and digestibility, (49) 166.
 hydrolyzed, digestibility, (45) 673; (47) 371.
 hydrolyzed, feeding value, (46) 67, 572; (47) 274; (48) 265, 871.
 hydrolyzed, production and feeding value, (48) 871, 872.
 levulose determination in, (47) 506.
 mulch, effect on nitrate production, (41) Mo. 623; (48) 720.
 presses, packers, and carriers, tests, (45) 186.
 seed beet, feeding value, (43) 373.
 stacks, building, (43) 91.
 treated with *Aspergillus*, digestion, (44) 567.
 utilization in soil, (44) 511.
 v. peat as litter, (44) 625.
- Strawberries—
 aerial fertilization with carbon dioxide, (41) Vt. 833.
 breeding experiments, (41) Alaska 41, 738; (43) 742; (44) 145, Alaska 336, Alaska 531, 533, Oreg. 836; (46) 39, 125; (47) Minn. 338, 340, Alaska 534; (49) Alaska 435; (50) Vt. 342, Alaska 539.
 bud selection, (43) 536; (45) Mo. 135.
 Chilean, culture, (48) 40.
 correlations in, (49) 236.
 culture, (41) 739; (42) Can. 536; (43) Nebr. 146, Nebr. 644; (44) Wash. 43; (45) Mo. 641; (46) 540; (47) Wash. 141, Minn. 338; (48) N.Dak. 37, 838; (49) Mont. 136; (50) Ohio 238.
 culture—
 and marketing, (43) 40; (48) Oreg. 838.
 at high altitudes, (44) Colo. 235.
 experiments, (48) Can. 38; (49) Alaska 435.
 in Minnesota, (41) Minn. 387.
 in Quebec, (42) 238.
 drying, Calif. (45) 808; (48) 507.
 dusting experiments, (43) 743; (45) 552.
 effect of sunscald, (49) 44.
 everbearing, culture, (46) Guam 733.
 everbearing, culture in Canada, (46) 234.
 fanning in relation to keeping quality, (43) 848.

Strawberries—Continued.

- fertilizer experiments, (41) Oreg. 44; (43) 833; (47) Ark. 740; (49) Oreg. 533.
 hardiness studies, (45) N.Dak. 236.
 improved hardy, production, (50) Alaska 140.
 in Connecticut, (46) 39.
 in refrigerator cars, carbon dioxid accumulation, (44) 536.
 insects affecting, (42) Can. 536; (43) Wash. 155; (44) Mo. 754; (47) 758, 849; (49) Ark. 554.
 keeping quality as affected by temperature when picked, (42) 247.
 marketing, (49) Ky. 293.
 microlepidopteran pests, (41) 257.
 nematode affecting, (49) Oreg. 539.
 new hybrid, (49) Nebr. 340.
 new or noteworthy, (49) N.Y.State 338.
 new varieties, (42) 637; (43) 438; (45) 140; (46) 640.
 nutrition studies, Mo. (48) 635; (49) 640.
 picking dates, (42) N.J. 835.
 picking while wet, (46) 447.
 pollination, (44) Oreg. 833; (48) 442.
 pot-grown, fertilizer experiments, (49) 833.
 preserving, (45) 665.
 protection from frost, (44) 811.
 spraying schedule, (44) Mo. 535.
 sterility, (50) Vt. 342.
 storage studies, (44) Calif. 738; (46) 338.
 storage temperature, (47) Calif. 640.
 unripe, decay, (47) 249.
 varieties, (45) Wash. 742; (47) Ark. 740; (48) N.Dak. 236; (50) Minn. 138, Ohio 238, Mich. 442.
 varieties for canning, (44) 534.
 varieties for Missouri, (44) Mo. 536.
 varieties in Canada, (46) 138.
 variety tests, (41) N.Dak. 147; (43) Ky. 339; (46) 839; (47) N.C. 535; (49) Mont. 136, Oreg. 532; (50) Can. 440.
 vitamin C in, (46) 667.
 weights per box, (41) N.Dak. 763.

Strawberry—

- bibliography, (44) 146.
 Botrytis, notes, (46) 741.
 club manual, (47) Ill. 195.
 crown borer, studies, (46) Ky. 462; (50) Tenn. 760.
 crown miner, notes, (44) Wis. 249.
 disease in Northwest, (44) 747.
 diseases, (42) Can. 536; (48) Calif. 541.
 diseases, control, (43) Ill. 847.
 extract for treatment of sprue, (47) 770.
 fruit rot, notes, (47) Calif. 646.
 hybrid, notes, (49) 436.
 industry on Cape Cod, (48) 790.

Strawberry—Continued.

- leaf beetle, control, (43) Md. 559.
 leaf blight, studies, (43) Ill. 753.
 leaf roller, control, (48) 651.
 leaf roller, parasite of, (50) 359.
 leaf scorch or mollisiose, notes, (47) 249; (48) 646; (49) N.C. 747.
 leaf spot, notes, (42) 740; (43) Wash. 155; (44) Ill. 839; (48) 842.
 louse, eastern, studies, (47) Ark. 455.
 mildew, (43) Wash. 155.
 nematode disease, (44) Oreg. 839; (45) 444; (47) Wash.Col. 541.
 plantations, renewal, (43) 836.
 red plant, studies, (49) 50.
 Rhizoctonia disease, (43) Wash. 155, Wash. 750; (48) 143.
 root disease, studies, (41) Can. 543.
 root knot, (47) Wash.Col. 541.
 root louse, notes, (41) 755.
 root weevil, control, mechanical devices for, (49) 848.
 root weevil, notes, (45) 454; (50) 259.
 root weevil, popular account, (46) 159.
 root weevil, summary, (47) 757; (48) West.Wash. 254.
 rootworm, control in commercial rose houses, (49) 658.
 rootworm on greenhouse rose, (50) U.S.D.A. 55.
 rootworm on roses, (43) 362; (45) 859; (46) N.J. 557; (47) 855.
 rot, origin of cavities in pycnidia, (49) 349.
 rots in Florida and California, (50) 48.
 sirup preparation, (48) Calif. 507.
 soft rot, (46) 544.
 stem rot, notes, (49) N.C. 747.
 thrips, notes, (47) Fla. 656.
 tiger moth, summary, (49) Ark. 253.
 tortrix, life history, (44) 254.
 tree, parasitic disease of, (46) 244.
 tree, treatise, (41) 653.
 weevil, notes, (45) 345; (47) 855.
 weevil, summary, (44) 60; (49) Ark. 554.
 wilt, (46) 44.

Stream—

- discharge measurements, improvement, (50) 685.
 discharge, predicting, (45) U.S.D.A. 722.
 flow as affected by forest cover, (46) 738.
 flow as affected by forests, (46) 141.
 flow checked against hydraulic formulas, (48) 285.
 flow experiment, (46) U.S.D.A. 779.
 flow, forecasting, (41) Nev. 211.
 flow in California, (50) 84.
 flow in Casa Grande Valley, (44) Ariz. 584.
 flow in the Sierras, forecasting, (42) 715.
 flow, measurements, (43) 787; (45) 687.

Stream—Continued.

flow measurements—

in Alberta and Saskatchewan,
(41) 583.

in Canada, (46) 380.

in New Mexico, (44) 685.

in Nile River, (44) 84.

of Pacific slope basins, (44) 189.

of South Atlantic slope, (44)
188.

flow through cleared and uncleared
floodways, (48) 285.

gauging in New Mexico, (42) 572.

gauging, instructions, (46) U.S.D.A.
688.

gauging records, (45) 687.

Streams—

of Texas, gazetteer of, (42) 887.

self-purification, (44) 186.

utilization for irrigation, (48) 89.

Streblomastix strix, studies, (41) 464.

Strength tester for paper, (42) 116.

Streptobacterium casei, notes, (43) 681.

Streptobacterium, new genus, erection,
(43) 680.

Streptococci—

acid production by, (44) 375.

ammonia production by, (46) 274.

antiserum, testing, (45) 883.

as affected by vitamins in animal
tissue, (41) 574.

beta hemolytic, differentiation of hu-
man and bovine, (42) 567.

carbon dioxide production by, (46)
274.

cultures, H-ion concentration, final,
(42) 474.

dairy and pathogenic, relation, (50)
878.

equine, immunization against, (45)
686.

growth, effect of protein hydrolysates,
(48) 560.

growth, relation to vitamins, (48)
657.

hemolytic, changes in virulence, (44)
181.

hemolytic, human and bovine, differ-
entiation, (47) 484.

hemolytic strains, (44) 276.

in infections of genital tract, (48)
Minn. 179.

in milk, source and significance, (42)
878.

in souring milk, (50) 279.

killed nonhemolytic, in blood, (44)
276.

lactic acid and pyogenes types, (44)
Pa. 776.

of bovine udder, (47) 682.

of equines, studies, (41) 580.

of feces and mouth of cows, (50)
377.

of horses, serum treatment, (41) 185.

of swine lungs, (47) 684.

resistance to germicides, (44) 680.

Streptococci—Continued.

toxicity of various dyes for, (41) 474.

toxin for leucocytes, (43) 684.

udder-infecting, (41) Mich. 681.

virulence, relation to hemolysin, (44)
680.

yeast extracts as culture media for,
(42) 708.

Streptococcus—

bovis, description, (50) 377.

citrovorus and paracitrovorus, effect on
quality of butter, (47) Iowa 382.

cremoris, new name, (43) 681.

empyema, dye therapy, (44) 680.

empyema, immunization, (42) 778.

epidemicus, cause of milk infection,
(42) 568.

genitalium nocens, notes, (49) Ky. 581.

growth, effect of plant tissue, (50)
184.

hemolyticus, biology, (41) 575.

hollandicus, notes, (44) 273.

immunity, studies, (41) 376.

infection, local immunity against, (50)
78.

infection, relation to rickets, (43) 264.

kefir, gas production of, (45) 73.

lactis—

acidity in, (47) Iowa 381.

as cheese starters, (43) 681.

comparison with pyogenes type,
(42) 773.

cultural characteristics, (45) 276.

cultures for cheese starters, (45)
577.

glairy form, (47) 79.

growth rate, (44) 272.

in milk as affected by Bacillus
subtilis, (44) 872.

physiological mutations in, (45)
380.

var. maltigenus, notes, (47) Iowa
382.

lactis—

culture in sterilized soil, (41)
812.

effect on keeping quality of butter,
(50) 476.

notes, (49) 201.

ropiness in cultures, (49) Iowa
376.

lanceolatus, notes, (46) 777.

paracitrovorus—

effect on keeping quality of butter,
(50) 476.

group in dairy products, (49)
Iowa 781.

in dairy products, (50) Iowa 179.

piima, suggested name, (49) 678.

pyogenes, notes, (46) 777.

pyogenes, stainability, (44) 675.

redefined, (43) 680.

serum for joint-ill, (42) 679.

spp. in lactic starters, (46) 76.

spp. in starters, volatile acid produc-
tion, (46) Iowa 76.

Streptococcus—Continued.

- spp., peroxid in cultures, (50) 787.
- spp., relation to sterility in cows, (45) 788.

viridans, acid production by, (43) 383.

Streptoleucocidin, studies, (43) 684.

Streptolysin production, (42) 880.

Streptothrix—

- cameli n.sp., description, (45) 77.
- group, behavior towards arsenic, (44) 78.

israeli, notes, (49) 380.

Streptotrichosis in the camel, (45) 77.

Striga—

- lutea in Burma, studies, (49) 843.
- lutea, parasitism by, (46) 343.
- seed, germination, (48) 741.
- spp. as root parasite of sugar cane, (47) 842.

Strigoderma arboricola, studies, (46) 252.

Stripe rust, life history studies, (49) 748.

Stromatinia laxa, notes, (47) 49.

Strongyles in aneurisms, control, (48) 579.

Strongylid—

- new, from the hog, (41) 579.
- parasites of horses, (46) 485.

Strongylidae—

- effect on coagulation of blood, (45) 478.

in horses, (41) 82, 87, 685; (44) 583.

Strongylidosis in horses, (46) 686.

Strongyloids, course of migration, (48) 680.

Strongylosis—

- gastrointestinal, of sheep and goats, (46) 883.
- in cattle, (44) 880.

Strongylus—

- contortus infection in lambs, (50) 878.
- contortus, notes, (45) Can. 887.
- equinus, traumatic action, (41) 580.
- paradoxus, notes, (49) 80.
- rubidus, cause of gastric lesions of pigs, (44) 378.
- spp. as affected by thymol, (46) 885.
- spp. in horses, (49) 77.
- spp., studies, (42) 776.
- tetracanthus, pathogenic rôle, (49) 400; (50) 81.

Strontium—

- barium, and calcium salts, differentiation, (45) 206.
- effect on bone development, (48) 563.
- hydroxid, solubility, (47) 508.
- in Hagerstown soil, (49) 617.
- in plants, (46) Colo. 28.
- in rats, rate of deposition and paths of absorption, (49) 765.
- process in sugar manufacture, (46) 616.

Structural design, treatise, (46) 486.

Structural materials, properties of (42) 280.

Structures—

- framed, design and construction, treatise, (50) 688.
- statically indeterminate, analysis (42) 887.

Strychnin—

- effect on caterpillars, (48) 550.
- repeated injections, tolerance of rats to, (46) 655.
- test for, (43) 116.
- toxicity to animals, (46) U.S.D.A. 654.

Stump—

- land reclamation, (48) Oreg. 587.
- pullers and pilers, (44) Wis. 685.
- pulling, draft required, (47) 187.

Stumpage on national forests, appraising, (50) U.S.D.A. 141.

Stumps—

- as affected by salt, (46) 733.
- cost of removing, (48) Ga.Coastal Plain 682.
- destruction by char-pitting, (44) 585.
- destructive distillation, (43) 888.
- killing with chemicals, (48) Calif. 588.
- removal—
 - dynamite v. horsepower, (42) Minn. 888.
 - effect of moisture on explosives, (42) Wis. 384.
 - forced v. delayed systems, (43) Minn. 480.
 - horsepower vs. dynamite, (43) Minn. 888.
 - in British Columbia, (45) 891.
 - in Germany, (42) 278.
 - with dynamite, (43) 480.
 - with explosives, (45) Ala.Col. 81; (46) U.S.D.A. 85.
 - with TNT, (42) 278; (43) U.S.D.A. 282.

Sturmia—

- distincta, parasitism by, (43) 453.
- sociabilis n.sp., description, (46) 57.

Stuttgart's disease, notes, (50) 253.

Stysanus stimonites in cold storage meat, (48) 258.

Suberin and cutin in plants, (46) 631.

Submaxillary glands in rats, growth in weight, (42) 559.

Subsoil acidity, (50) 619.

Subsoiling—

- experiments, (45) N.Dak. 212.
- necessity in Missouri orchards, (42) 482.
- new implements for, (47) 391.
- v. fall plowing, (42) Wis. 323.
- value, (47) U.S.D.A. 429.
- with dynamite, (42) 183; (43) 480; (45) Miss. 223.

Subsoils of prairies, moisture content, (41) 514.

Subsoils, rawness, (41) 322.

Succisa australis, notes, (44) Pa. 737.

Succulence in plants, basis, (42) 433.

Suckling, relation to embryonic development, (41) 862.

Sucrase, presence in potato juice, (42) 502.

Sucrose—

alpha-naphthol test for, apparatus, (50) 11.

and raffinose mixtures, analysis, (46) 205.

determination, (41) 208, 799; (42) 613; (44) 413, 805; (45) 719, 820; (46) 506; (47) 112, 408.

determination—

cryoscopic method, (45) 208.

in presence of other sugars, (48) 314; (50) 614.

use of invertase for, (46) 506.

use of iodine in, (48) 414.

gum levan formation from, (50) 410.

hydrolysis in stomach, (47) 166.

in fruit juices, formulas, (47) 808.

in presence of glucose, test, (46) 807.

solutions, dilute, application of Clerget method, (45) 317.

solutions, levan formation, (44) La. 116.

Sudan grass—

analyses, (42) 866; (45) 41.

and related plants, (46) U.S.D.A. 441.

and soy beans as emergency hay crop. (49) Wis. 629.

as dry-farm crop, Ariz. (41) 29; (43) 733.

as emergency hay crop, (49) Wis. 629.

as hay and forage, (43) 527.

as hay and pasture crop in Kansas. (42) 234.

as hay crop, (42) Wis. 338, Mich. 631.

as pasture crop, (43) U.S.D.A. 171; (46) Iowa 363, Kans. 478.

as short season hay crop, (47) Mich. 131.

breeding experiments, Okla. (45) 431; (47) 824.

culture, (43) Iowa 235, U.S.D.A. 435.

U.S.D.A. 639; (44) Ariz. 523; (45)

N.Dak. 734, Ariz. 739; (47) Wis.

431.

culture—

and use in Australia, (47) 227.

experiments, (41) Tex. 35, Mo. 637; (42) Calif. 823, Tex. 828;

(43) Tex. 34, U.S.D.A. 134, Idaho 733; (44) N.Dak. 524;

(45) 631; (49) Mont. 430.

experiments in Sweden, (50) 735.

in Guam, (42) Guam 31.

in New South Wales, (42) 439.

in Ohio, (41) Ohio. 234.

cyanogenesis in, (42) 610.

description, (42) U.S.D.A. 340.

diseases, control, (43) Tex. 845.

feeding, effect on horses, (46) 678.

fertilizer experiments, (43) 230; (49) 329.

field tests, (41) N.Dak. 824.

for dairy cattle, (43) Kans. 176.

Sudan grass—Continued.

for pastures, (50) 533.

for silage, (41) Mo. 334, 732.

for summer pasture, value, (47) U.S. D.A. 470.

fungus disease, (48) 453.

growth in alkali soils, early, (42) Utah 28.

hay, analyses. (45) Kans. 33.

hay, composition and digestibility, (45) Okla. 373.

hay v. alfalfa hay for dairy cows, (47) Ariz. 876.

hay, yields, (45) Wis. 227.

hydrocyanic acid in, (46) 179.

hydrocyanic acid in, effect on cattle. (45) 179.

irrigation water requirements, (47) Kans. 630.

leaf blotch, (46) 647.

notes, (49) Guam 427.

pasture, value for milk production. (49) Kans. 472.

prussic acid, poisonous to cattle, (46) 484.

seed, analyses, (44) 233.

seed and silage yields, (41) Nev. 227.

seed production, (43) Nev. 229.

seed screenings, analyses, (46) Tex. 675.

seed, weeds in, (46) 838.

seeding experiments, (41) Idaho 225;

(43) Okla. 33, Tex. 230, Iowa 235,

Ind. 330, Mo. 736, Wis. 227; (45)

Kans. 32, Mo. 224, Okla. 430; (47)

Ark. 732, Okla. 824; (48) Mo. 628;

(49) Okla. 428.

silage, composition, (43) Okla. 68.

smut, notes, (45) 842.

v. alfalfa, feeding value, (50) Kans. 68.

v. Paspalum dilatatum as pasture for cows, (42) 866.

variety tests, (43) U.S.D.A. 134.

wheat-head army worm affecting, (43) 54.

yields, (41) Ariz. 332; (44) N.Dak. 30; (46) Mo. 326.

Sudan III, behavior in animal organism, (41) 672, 673.

Suet, detection in lard, (45) 315; (46) 14, 311.

Sugar—see also Beet sugar.

adsorption in solution and at interfaces, (47) 802.

analysis, (45) 111.

apparatus for detecting, (50) 11.

ash determinations, (49) 505.

Sugar beet—see also Beets, sugar.

agriculture in United States, (49) 737.

bacterial rot, (47) Colo. 648.

by-products, feeding value, (42) U.S.D.A. 370.

crown gall, studies, (48) 843.

curly leaf, notes, (41) 456.

Sugar beet—Continued.

- curly leaf, use of systematic observations on, (48) 651.
- curly top, leafhopper as carrier, (50) 660.
- curly top, susceptibility of other plants to, (43) 752.
- diseases, (44) 154; (46) 450, 744.
- dry-rot canker, (46) 147.
- fodder, feeding value, (42) 369.
- growing work of British Board of Agriculture, (41) 200.
- industry, (47) Calif. 691.
- industry, chemical problems, (44) 116.
- industry in Europe, (42) 532.
- industry in United States, (46) U.S.D.A. 134.
- industry, technology, (46) 417.
- juices, foaming, (42) 211.
- leaf spot, control, (50) 336.
- leafhopper, *see* Beet leafhopper.
- leaves, nitrogen compounds in, (45) Wis. 226.
- leaves, sugars in, (42) 334.
- molasses for fattening steers, (44) 672.
- mosaic disease, (48) 453.
- nematode in Utah, (45) 847.
- nematode in Utah, dormancy period, (49) U.S.D.A. 47.
- nematodes, notes, (46) 744; (47) U.S.D.A. 151; (48) 48.
- products, nitrogen distribution in, (43) 206.
- pulp, feeding value, (42) 769.
- root louse, control, U.S.D.A. (43) 451; (44) 754.
- root maggot, notes, (48) 752.
- seed as affected by heat, (44) 831.
- seed production in Denmark in 1918, (42) 135.
- seed production in Rocky Mountain States, (44) U.S.D.A. 335.
- seed, selection by refractometer, (46) 807.
- seed stock, improving, (47) Mich. 828.
- seed testing, (49) Mich. 35.
- seeds, feeding value, (42) 369.
- sirup, examination, (46) 507.
- sirup, making, (44) Idaho 15, Ohio 117, Ohio 714; (46) 207, U.S.D.A. 207.
- sirup, potassium in, (44) 116.
- sirup, preparation and use, (41) 117.
- sirup, recipe, (43) 808.
- stalks, digestion coefficients, (43) 373.
- station, establishment, (49) Mich. 495.
- top silage, analyses, (45) Idaho 573.
- tops, feeding value, (42) 769.
- Typhula rot, control, (45) 146.
- waste, composition and digestibility, (43) 267.

Sugar beet—Continued.

- webworm—*see also* Beet webworm.
- control, (44) 655.
- life history, (50) 336.
- notes, (41) Mont. 57; (43) Colo. 158, Mont. 758; (45) Mont. 359
- Sugar beets—
 - analyses, (44) Alaska 523.
 - analyses and yields, (48) Can. 31.
 - animal pests, (44) 154.
 - as affected by—
 - alkali salts, (41) 623.
 - climate, (46) 115.
 - guanols, (44) 25.
 - neutral phosphate, (49) 517.
 - salt, (46) 719.
 - soil acids, (42) Wis. 324.
 - breeding experiments, (48) Mich. 224.
 - comparative field experiments, (50) 738.
 - composition and yield, factors affecting, (46) 637.
 - cost before and after the war in France, (42) 593.
 - cost of production, (45) Idaho 189, U.S.D.A. 829; (47) Idaho 593.
 - cost of production in Belgium, (49) 895.
 - cost of production in Colorado, (44) U.S.D.A. 789.
 - culture, (43) Mont. 35; (44) Alaska 328, Alaska 522; (45) Mich. 635; (49) N.Mex. 525.
 - culture—
 - and storage, (45) Wis. 229.
 - directions, (47) Minn. 334.
 - experiments, (41) Can. 528, 638; (43) N.Mex. 332; (44) 827; (45) Kans. 33, Nebr. 531, 631, Can. 823; (46) 131; (47) 337, Nebr. 736; (48) N.Dak. 226, Hawaii 331, 434; (49) Alaska 426.
 - in Australia, (48) 630.
 - in Italy, (47) 532, 634.
 - in Louisiana, (47) 37.
 - in Wyoming, (42) Wyo. 135.
 - labor-saving devices for, (41) U.S.D.A. 337.
 - treatise, (44) 529.
 - date-of-planting tests, (41) Nev. 228.
 - effect of preceding crop, (46) R.I. 233.
 - Mont. 129; (49) Nebr. 733.
 - electroculture experiments, (50) 131.
 - feeding value, (41) Nebr. 771; (42) U.S.D.A. 374.
 - fertilizer experiments, (41) 229, 424, Nebr. 433, 638, 815; (42) 221, 327, -329; (43) 126, 231; (44) 815; (45) Ohio 126, U.S.D.A. 530; (46) Mich. 518; (47) 322, 337, 726; (48) 439, 823; (50) 423.
 - following alfalfa, (44) U.S.D.A. 33.
 - growth in alkali soil, early, (42) Utah 28.

Sugar beets—Continued.

- handbook, (44) 636.
 - home-grown, sirup from, (42) 507.
 - improvement, (50) 439.
 - improvement in Spain, (50) 832.
 - insects affecting, (44) 351; (48) 550.
 - irrigated, culture, (41) Wash. 39.
 - irrigation experiments, (41) Nev. 728; (43) 230; (48) Utah 284; (50) 136.
 - liming experiments, (45) Ohio 126.
 - manuring experiments, (43) Utah 218; (45) Ohio 126.
 - marc in, determination, (41) 313.
 - nutritive value, (47) Calif. 668.
 - Phyllotreta utana on, (43) 854.
 - pictorial atlas, (50) 235.
 - potassium ammonium nitrate for, (41) 627.
 - premature seed formation, (50) 832.
 - production in Holland and Belgium, (47) 828.
 - production in Prussia during the war, (42) 234.
 - rotation experiments, (42) U.S.D.A. 336; (43) 435; (44) 732; (45) Ohio 126; (46) 725; (49) Nebr. 328.
 - seed, isolation of, (43) 532.
 - seed production, (45) 740, 832; (47) 634; (50) 832.
 - sodium for, (41) R.I. 426.
 - spacing experiments, (50) 737.
 - storage experiments, (48) Calif. 529.
 - studies, (50) 336.
 - sugar in, (43) Can. 735; (44) Alaska 329.
 - thinning experiments, Nebr. (41) 434; (43) 637.
 - time of planting, relation to leafhopper migrations, (48) Calif. 550.
 - time of thinning, (45) U.S.D.A. 530.
 - undug over winter, variation in composition, (47) 828.
 - varieties, (48) Calif. 528.
 - varieties, sugar in, (50) 639.
 - variety tests, (41) 638; (43) 528, Can. 735; (44) Alaska 523; (46) 131; (47) Minn. 332, 337, Alaska 527, 824; (48) Can. 31, Can. 227, Minn. 331; (49) Alaska 426, Can. 734; (50) Minn. 133, Can. 432, Can. 533.
 - water requirements, (43) Colo. 185.
 - whole juice sugar from, (44) 413, 414.
 - yields, (47) Nebr. 736.
 - yields and feeding value, (41) Nev. 228.
- Sugar bush on farm woodlots, (47) Mich. 147.
- Sugar cane—*see also* Cane.
- abnormal, in Australia, (50) 833.
 - alcohol from, (47) 207.
 - and beet, comparison, (48) 654.
 - and sugar production in Peru, (48) 393.
 - aphis, yellow, notes, (42) 52.
 - aphis, yellow, relation to mottling disease, (44) 159.

Sugar cane—Continued.

- as affected by ultra-violet rays, (43) 730.
- assimilation of phosphoric acid by, (50) Hawaii 217.
- bacterial heart rot, (42) 844.
- beetle borer parasite, (42) 754.
- beetles, natural enemies, summary, (48) 360.
- beetles, notes, (45) 558.
- beetles of Australia, (48) 358.
- blight in Trinidad, (42) 643; (45) 545.
- borer—
 - biology, (44) 353.
 - control, (43) La. 659, 852; (44) 353; (49) La. 848.
 - control by parasites, (41) 261, 462.
 - habits and abundance, (48) 357.
 - new, notes, (48) 852.
 - notes, (45) V.I. 150; (47) 256, 357.
 - on banana, (41) 660.
 - studies, (41) U.S.D.A. 60; (42) 234.
- branching, (42) 235.
- breeding experiments, (41) 528, 736, 830; (44) 136, 137; (45) V.I. 126; (48) 434, 629, 830; (49) 735.
- breeding in Philippines, (50) 537.
- bud variations in, (41) 337.
- buds, effect of frost on, (47) 737.
- burned, analyses, (47) 231.
- chlorin in, determination and effects, (41) 736.
- chlorosis, (42) 150.
- chlorosis in Egypt, (49) 647.
- critical periods in growth, (50) 336.
- crushers, animal power, tests, (49) 586.
- crushing, advantages of engine power, (42) 184.
- cultivation, (44) 383.
- cultivation methods in Java, (44) 383.
- culture, (46) V.I. 33; (49) 230, 828; (50) 637.
- culture—
 - experiments, (41) 529, 729, 826; (42) 132, 436; (44) 137, 433, 436, 527, 632, 733, 827; (45) 34, 35, 41, 340, 532; (46) 131, 227, 437, 634, 836; (48) 434, 629; (50) 28.
 - improved methods, (45) 343.
 - in Burma, (41) 529.
 - in French colonies, (45) 343.
 - in Guadeloupe, (49) 737.
 - in Hawaii, (41) 736.
 - in India, (44) 636.
 - in New South Wales, (46) 135.
 - in Peru, (44) 530.
 - in Porto Rico, (42) 36.
 - in Queensland, (44) 438.
 - in South Africa, (41) 528.
 - in St. Vincent, (41) 528.
 - in Uganda, (42) 32.

Sugar cane—Continued.

- culture—continued.
 - methods, (42) 514.
 - use of leaves and tops, (48) 35.
 - with cowpeas, (48) 35.
- cut, deterioration, (50) 236.
- cuttings, sour rot in, (45) 52.
- depreciation, (49) 35.
- disease, new, in Philippines, (46) 347.
- disease, new, in Porto Rico, (42) 644.
- disease survey in India, (46) 544.
- diseases, (41) 450, 841; (44) 150, 438, 446; (45) La. 247, 541, 651; (46) 550.
- diseases—
 - and pests in Philippines, (45) 51.
 - in Cuba, (49) 737.
 - in Hawaii, (42) 149.
 - in Negros, (49) 444.
 - in Philippines, (46) 45.
 - problems, (45) 545.
- distribution of solutes in sap, (41) 525.
- "djamoer oepas," notes, (44) 445.
- downy mildew in Philippines, (48) 454.
- dry top rot, notes, (50) 351.
- effect of subsoiling, (42) 514.
- experiments, (41) 234; (45) 3^c; (48) 631; (50) 738.
- experiments—
 - in British Guiana, (50) 640.
 - in Cuba, (49) 737.
 - in Hawaii, (49) 35.
 - in Philippines, (50) 236.
- eye spot disease, (42) 149.
- fertilizer experiments, (41) 528, 529, 533, 817, 826; (42) 30, 132, 234, 436, 518, 519, 532, 735; (43) 425, 532, La. 626; (44) 136, 137, V.I. 332, 632, 633, 733; (45) 34, 35, 41, 132, La. 223, 517, 532, 734, 739, 830; (46) 131, 227, 437, 534, 634, 727, 836; (47) 218, La. 427, 737; (48) 230, 434, 629, 631, 830, 834; (49) 133, La. 824, 828; (50) 28, 322.
- fertilizer experiments in India, (42) 517.
- fiber, acid hydrolysis, (44) 809.
- fields, burning, (47) 231.
- Fiji disease, (46) 45, 46, 346, 347, 651.
- Fiji disease in Philippines, (48) 847.
- Fiji galls, organism in, (49) 444.
- flies, West Indian, notes, (44) 159.
- formation of sugar in, (48) 632.
- froghopper blight—
 - in Trinidad, (46) 154.
 - notes, (41) 843.
 - relation to root fungus, (42) 356.
 - summary, (48) 53.
 - treatment, (42) 745.
- frozen, utilization, (46) 34.
- fungi, check list, (46) 346.
- fungi, control, (42) 353.
- germination as affected by fungi, (43) La. 348; (45) 848.

Sugar cane—Continued.

- green manuring experiments, La. (49) 824; (50) 33.
- growth, (45) 627.
- grubs, control, (41) 251; (48) 58; (50) 848.
- grubs in Antigua, (41) 462.
- grubs, natural enemies, (44) 653.
- grubs, notes, (42) 545; (45) 55; (46) 153.
- gumming disease, (45) 443; (46) 148; (47) 47, 838; (49) 539, 550; (50) 351.
- gummosis, (44) 51.
- gummosis, cause, and control, (45) 146.
- gummosis in Porto Rico, (46) 450.
- gummosis, studies, (45) 51; (46) 242.
- hot-water treatment, (50) U.S.D.A. 525.
- hybridization, (45) 433.
- improvement, (45) 228.
- improvement in Bengal, (50) 828.
- improvement in India, (41) 522, 529.
- in Java, (50) 640.
- Indian, varieties for different localities, (42) 236.
- Indian varieties, studies, (42) 235.
- industry of Brazil, (42) 635.
- industry of Queensland, (49) 828.
- insects affecting, (41) 354; (42) 545, 748; (43) 252, 450; (44) 159, 438; (45) 55, V.I. 150, 359; (46) 153, 748; (47) 551, 848; (48) 355; (49) 758; (50) 153, V.I. 555.
- insects affecting in Fiji, (43) 52.
- insects affecting in India, (45) 656.
- insects affecting in Queensland, (42) 751.
- insects of Porto Rico, (46) 558.
- irrigation experiments, (46) 634.
- irrigation in Hawaii, (50) 483.
- Japanese, as silage crop, (41) Tex. 36.
- Jaya, in Louisiana, possibilities, (47) 37.
- juice—
 - changes during sirup manufacture, (41) 507.
 - clarification, (44) U.S.D.A. 206; (46) 508; (47) 507; (50) 715.
 - clarification, effect of temperature, (43) 507.
 - color and colloids as affected by carbons, (46) 508.
 - color changes of, (42) 115.
 - decolorization as affected by pH, (46) 508.
 - filtration, (47) 206.
 - nondefecable, causes, (46) 616; (47) 15.
 - phosphoric acid in, (49) 120.
 - precipitates, settling, (44) 807.
- Lahaina disease, (42) Hawaii 352; (46) 347, Hawaii 647.
- Lahaina, nematode injury, (42) 150.

Sugar cane—Continued.

- leaf disease, new, (45) 651.
- leaf miner, notes, (43) 52.
- leaf scale, relation to mottling, (44) 159.
- leaf spot, notes, (49) 839; (50) 244.
- leaf stripe, (45) 651.
- leaf stripe in Philippines, (45) 848.
- leafhopper—
 - beetle attacking, (44) 550.
 - control, (50) 356.
 - in Hawaii, (43) 450.
 - notes, (43) 52; (45) 551; (46) 558; (48) Hawaii 355.
 - parasites of, (43) 661, 662.
- liming experiments, (42) 524; (45) 734.
- linear bug, notes, (44) 653.
- mealybug, notes, (43) 52; (45) 453; (48) 854; (49) 52.
- megass, bacterization, (44) 513.
- methods of testing maturity, (49) 527.
- molasses as fertilizer for, (44) 218.
- mosaic, *see* Sugar cane mottling disease.
- moth borer and European corn borer, comparison, (47) 55.
- moth borers, (43) 52; (45) 857.
- moth borers in British Guiana, (50) 155.
- mottling disease, (42) 46, U.S.D.A. 449, 644, 736, 744; (43) 548; (44) 52, 746, 846, 847; (45) 443, 651, 843, 848; (46) 46, 347; (47) 148, 544, 648, 838, 842, 847; (49) 539; (50) 551, 840.
- mottling disease—
 - artificial transmission, (45) Okla. 453.
 - cause, (45) 354.
 - control, (43) 47; (45) Miss. 52.
 - cultivated and wild hosts, (49) 647.
 - description, (46) 346.
 - effect on crop, (49) 827.
 - eradication, (45) 545.
 - in Cuba, (49) 737.
 - in Negros, (49) 444.
 - in Porto Rico, (45) 52.
 - mechanics of insect inoculation, (49) 47.
 - nature, (50) 351.
 - relation to manures, (50) 42.
 - resistant varieties, P.R. (42) 150; (48) 227.
 - resistant variety, (43) 152; (45) La. 247.
 - spread, factors affecting, (49) 544.
 - survey, (44) 748.
 - transmission, (42) 643; (43) 547, 548; (44) 159; (48) 246, P.R. 251; (49) 52, 550.
 - variations in, (45) 449.
- new moth pest in Queensland, (46) 658.
- Olaa disease, notes, (49) 445.
- oxalic acid in, (44) 201.

Sugar cane—Continued.

- Pahala blight, (42) 150.
- palatability of silage from, (49) Ga. 524.
- paper mulching for, (44) 437.
- pests, control, (48) 753.
- photosynthesis, (45) 125.
- pineapple disease, (46) 46.
- planting distances, (44) 231.
- planting, new method, (48) 734; (49) 334.
- pollen, germination and preservation, (47) 828.
- pollen, viability, (45) 830.
- pollination apparatus, (46) 135.
- production in Cuba, (42) 31.
- production in Philippines, (43) 830.
- products, bacteria in, (47) 48.
- propagating, (44) 436.
- propping, (48) 134.
- purchase, on sucrose content basis, (45) 536.
- ratoon crops, value of subsoiling, (42) 514.
- red rot, cause, (44) 51.
- red rot, notes, (47) 44.
- rhinoceros beetle, notes, (47) 855.
- rind disease, notes, (43) 152.
- ring spot, notes, (42) 150.
- root borer, control, (49) V.I. 352.
- root borer, notes, (44) 57; (46) 534.
- root disease, (42) 643, 645, 844; (43) 243; (45) 443, 449; (46) 347, 550, 647; (47) 248; (48) 48, 49; (50) 351.
- root disease in Trinidad, (42) 745.
- root fungus, relation to froghopper blight, (42) 745.
- root parasite, life history and control, (50) 248.
- root parasites, (46) 343.
- rotation experiments, (44) 632; (45) 35, 532; (46) 437; (48) 629.
- seed, disease-free, selecting, (44) La. 155.
- seed from Argentina, (44) 529.
- seed from high altitudes, (42) 736.
- seed packing for transportation, (44) 231.
- seedlings and hybridization, (45) 829.
- seedlings, Coimbatore, tests, (48) 734.
- seedlings from Tucuman, (46) 135.
- seedlings, method of raising, (44) 137.
- seedlings, producing and testing, (48) 632.
- seedlings, tests, (45) 830; (49) 827.
- seedlings, yield data, (47) 737.
- selection experiments, (44) 633.
- sereh disease, studies, (42) 736; (46) 346.
- sets, hand v. machine planting, (42) 786.
- sieve tube disease, cause and control, (43) 548.
- sirup canning, (44) U.S.D.A. 489.
- sirup making, (45) Miss. 636.

Sugar cane—Continued.

- sirup manufacture, invertase in, (46) 312.
- sirup, manufacture on small scale, (45) 208.
- sirup, manufacture to prevent crystallization, (45) 317.
- smut, mode of infection, (45) 449.
- smut, notes, (41) 52; (43) 444; (44) 446; (46) 46.
- soils, effect of molasses, (50) 820.
- soils, mechanical tillage, (48) 684.
- soils, nitrification, (47) 215.
- spacing experiments, (41) 338; (44) 636; (46) 535.
- specific gravity, (44) 636.
- Striga as root parasite of, (47) 842.
- stripping experiments, (41) 534.
- tannin, nature of, (42) 115.
- top meal, analyses, (44) Hawaii 71.
- top-rot disease, (46) 46.
- two-year, studies, (48) 35.
- Uba, in Porto Rico, (50) 640.
- varieties, (45) 41; (46) 835; (47) 842; (48) 35; (49) 35, 827.
- varieties—
 - analyses, (48) 629.
 - analyses and yields, (48) 630.
 - as affected by salinity, (41) 736.
 - distribution in Java, (48) 632.
 - frost resistant, (47) 231.
 - identification, (45) 739.
 - improvement, (50) 833.
 - in Dutch East Indies, (42) 235; (45) 739.
 - in Hawaii, (43) 830.
 - in Java, (41) 644; (46) 441; (46), 32.
 - in Porto Rico, (41) 830; (45) 599; (47) 635; (50) 738.
 - key, (46) 730.
 - new, (49) 828.
 - resistant to froghopper blight, (42) 745.
 - sucrose production in, (47) 824.
 - yields, (44) 136; (46) 727.
- variety tests, (41) 528, 529, 736, 825, 826; (42) 30, 132, 230, 234, 436, 533, 635, 735; (43) La. 636; (44) 136, 137, V.I. 332, P.R. 432, 433, 632, 633, 735, 827, 832; (45) 34, 35, V.I. 126, 132, La. 223, 434, 532, 734, 830; (46) 131, 226, 227, 437, 534, 535, 634; (48) V.I. 332, 434, 629, 830, 834; (49) 138, Guam 427, 828; (50) 28, V.I. 533.
- vascular organism in, (48) 48, 49.
- vitamin D in, (50) 564.
- waste, fertilizing value, (42) 518.
- wax, constituents, (44) 202.
- white grubs affecting, (42) 751; (43) 52; (46) 250; (48) 254.
- windrowing, (45) 343; (46) 730; (48) 734.
- wireworms, notes, (43) 52.
- wrapping, (50) 33.

Sugar cane—Continued.

- Yellow Caledonia, for Porto Rico, (45) 536.
- yellow stripe, control, (41) 347.
- yellow stripe in Java, (45) 52.
- yellow tip, (42) 150.
- yields, (46) 534.
- Sugar—
 - caramelization, formic acid formation, (50) 805.
 - chemistry of, progress, (41) 614.
 - coloring matters in, importance, (44) 14.
 - complete, manufacture from sugar beets, (44) 413, 414.
 - concentration in blood, (44) 863.
 - conserving our natural resources, (42) 252.
 - cost of production, (41) 534.
 - countries, yield deterioration in, (48) 440.
 - crude, factors affecting hardness, (42) 713.
 - crystallization, (42) 211.
 - crystals, examination, (46) 113.
 - decolorization, (41) La. 208, La. 415; (44) La. 14, 808.
 - decomposition, acetaldehyde in, (45) 611.
 - defecation, new clarifiers for, (44) 808.
 - detection in condensed waters, (49) 408.
 - deterioration, bibliographic review, (48) 314.
 - deterioration by fungi, (41) La. 416, 507.
 - deterioration by molds, factors affecting, (43) 507.
 - deterioration in storage, (43) 616; (44) La. 115, 713; (48) 112.
 - deterioration, prevention, (44) 115, La. 115.
 - determination, (41) 115.
 - determination in blood, *see* Blood sugar.
 - dietetic value, (46) 258.
 - digestibility in feeding stuffs, (47) Tex. 471.
 - effect of mold spores in, (42) 803.
 - effect on gastric secretion, (44) 665.
 - effect on growth of albino plants, (44) 223.
 - effect on molds, (45) 463.
 - effect on nitrogen in soils, (42) 425.
 - factor of safety, study, (49) 614.
 - factory of Roye in Santerre, organization, (49) 489.
 - feeding, effect on blood, (44) 564.
 - fermentation by molds, (48) 203.
 - formation and ripening in sugar cane, (48) 632.
 - formation in a sulphite digester, (48) 415.
 - formation in drying potatoes, (42) 211.

Sugar—Continued.

- from whey, use in candy making, (42) Wis. 316.
- fumaric acid fermentation, (43) 15.
- glycerin production from, (41) 507.
- in apples in storage, (50) 542.
- in blood, *see* Blood sugar.
- in blood of pigeons during ovulation, (48) 273.
- in body fluids, determination, (43) 416.
- in cattle feeds, (43) 671.
- in oat straw, variations, (49) 65.
- in sugar beet leaves, (42) 334.
- in Tropics, (42) 599.
- in urine after injection of glucose in the dog, (49) 859.
- in urine, determination, (43) 416; (46) 417; (47) 315, 366.
- in urine of infants, (45) 263.
- in urine, variation, (47) 263.
- in wheat varieties, (47) 222.
- industry—
 - and by-products, (46) 535; (47) 635.
 - in Antigua, (46) 226.
 - in Argentina, (47) 532.
 - in Argentina, protection, (45) 895.
 - in British Guiana, (41) 501.
 - in British Virgin Islands, (42) 230.
 - in Hawaii, (41) 736.
 - in Java, historical and economic survey, (45) 41.
 - in Montserrat, (44) 827.
 - in Natal and Zululand, (47) 828.
 - in Queensland, (45) 41.
 - in West Indies, (41) 825.
 - native, in China, (48) 13.
 - of Louisiana, origin and development, (49) 737.
 - statistics of production and consumption, (49) 737.
 - use of labor-saving devices in, (42) 284.
 - utilization of by-products, (50) 715.
- inversion by mineral acid soil, (46) 621.
- inversion by soils, (41) 321.
- inversion during manufacture, determination (43) 507.
- inversion during manufacture, prevention, (43) 416.
- inversion in stored oranges, (43) 203.
- invert, determination, (42) 416; (43) 314; (44) 805.
- invert, determination in presence of sucrose, (45) 317.
- invert, determination, table for, (46) 506.
- invert, relative sweetness, (47) 808.
- juices, neutral clarification, (50) 413, 615.

Sugar—Continued.

- keeping quality, factors affecting, (43) La. 807; (44) 115.
- kinds in same material, determining, (46) 506.
- lump, energy content, (42) 660.
- manufacture, (47) 112, 206, 507, 508.
- manufacture—
 - ammonia recovery as by-product, (44) 128.
 - chemical control in, (44) 15.
 - chemical progress in, (48) 712.
 - chlorin balance during, (45) 317.
 - conforming to "factor of safety," (49) 614.
 - decolorizing carbons in, (44) La. 14.
 - handbook, (41) 417.
 - in France, (43) 261.
 - in Hawaii, (45) 317.
 - in Philippines, (43) 830.
 - measuring color in, (44) 807.
 - processes, (44) 413, 414.
 - treatise, (44) 506; (47) 507.
 - use of lime, barium, or strontium in, (46) 616.
 - use of superheated steam in centrifugals, (44) La. 116.
- manufacturing machinery, (42) 284.
- maple, *see* Maple.
- media, preparation, (47) 803.
- methods of investigation and standards, (41) 558.
- mill laboratories, simplified tests in, (50) 715.
- minimum need, (41) 468; (42) 165.
- mixtures, analysis, formulas, (46) 807.
- moisture absorptive power, (47) 801.
- mold hyphae in, (46) 431.
- morphogenetic influence on plants, (41) 819.
- operations in India, (49) 737.
- oxalic acid production from, (43) 112.
- oxidation, notes, (42) 503.
- palm, culture, (44) P.R. 235.
- plantations, use of motor trucks and tractors, (42) 892.
- popular discussion, (45) 719.
- preservation of fruit by, (45) 665.
- production—
 - and consumption in British Empire, (41) 806.
 - in Brazil, (43) 292.
 - in French colonies, (49) 389.
 - in Mexico, (49) 737.
 - in Philippines, (44) 807.
 - in plants, (42) 527, 627.
 - in West Indies, (45) 33.
 - relation to rainfall and froghopper blight, (42) 510.
- products, analysis, methods, (45) 109.
- products, determination of gums in, (48) 505.
- progress since 1912, (50) 615.
- purity determinations, (48) 111.

Sugar—Continued.

- quantity for jelly making, (43) 617.
 - raw and refined, moisture absorption, factors affecting, (49) 613, 614.
 - raw, ash determination, methods, (49) 408.
 - reducing, determination, (41) 412.
 - refinery furnaces, value of ashes from, (47) 218.
 - refining, boneblack v. decolorizing carbons, (48) 505.
 - refining, decolorizing and purifying, (44) 615.
 - refining, foaming in, (42) 211.
 - refining, limits of H-ion concentration in, (50) 11.
 - refining, polarizing constants, (44) 615.
 - refining with Norit, (47) 206.
 - refining without boneblack, (45) 509.
 - renal threshold for, (44) 65.
 - report of A.O.A.C. referee, (41) 799.
 - research institute in Czechoslovakia, (50) 400.
 - retail prices in North Dakota, (42) N.Dak. 363.
 - rôle in economic progress and international trade, (49) 94.
 - rôle in respiratory combustion in plants, (43) 226.
 - samples, preservation, (41) 280.
 - school of Habana, organization, (45) 495.
 - seeding method of graining, (43) 416.
 - sirup industry in Philippines, (44) 807.
 - sirups, decolorization with kelpchar, (47) 411.
 - sirups, preparation in the home, (42) 255.
 - solution, stereochemical changes, (44) 259.
 - solutions, concentrated, mold fruiting bodies in, (43) 226.
 - solutions, deterioration, cause, (46) 206, 417.
 - solutions, effect of concentration on microorganisms, (42) 114, 627.
 - solutions, invertase activity of mold spores in, (42) 803; (43) 433.
 - solutions, raw, crystal formation, (42) 211.
 - solutions, stereochemical changes, (47) 62.
 - substitutes in bottled soft drinks, (41) U.S.D.A. 669.
 - substitutes in Germany, (43) 204.
 - substitutes in meat curing, (44) U.S.D.A. 557.
 - supply of France, (41) 593.
 - synthesis, (43) 202.
 - use in Bordeaux mixture, (47) 242.
 - yields in Philippines, (50) 795.
- Sugars—*see also* Glucose, Sucrose, *etc.*
- aldose, Rosanoff's diagram, revision, (49) 503.
 - color absorption from, (43) 412.

Sugars—Continued.

- color determinations, (43) 715.
 - determination by fermentation, (44) 204.
 - determination by inversion, (43) 615.
 - iodometric determination, (43) 507; (45) 112.
 - mixtures of, determination, (45) 413.
 - rare, standardization, (46) 113.
 - reducing, determination, (43) 806; (45) 805; (48) 412; (49) 310; (50) 413.
 - reducing, determination, effect of alkaline earths, (49) 715.
 - reducing, electrometric titration, (49) 203.
 - reducing, in lead-preserved cane juices, (46) 506.
 - reducing, movement in apple trees, (43) N.H. 28.
 - reducing, quantitative determination, (46) 113.
 - South African, deterioration, (46) 206, 417, 418.
 - toxicity in avitaminosis, (50) 164.
- "Sugola," process for making, (45) 510.
- Suipestifer bacterins, experiments with, (48) 277.
- Sulco V. B., tests, (46) Mass. 50.
- Sulfinid determination in saccharin preparations, (44) 806.
- Sulfonation—
- effect on potassium of greensand, (43) 517.
 - effect on rock phosphate, (41) 324.
 - effect on soil constituents, (41) 324.
 - solvent action of, (46) Ohio 428.
- Sulfoleum and nicotin sulphate, (44) Mass. 453.
- Sulfomonas thiooxidans, growth and respiration, (50) 517.
- Sulfonation of aromatic compounds, use of catalysts in, (44) 610.
- Sulfonphthalein indicators, new, (48) 804.
- Sulgene, effect on plants, (46) 544.
- Sulla, characteristics and uses, (48) 435.
- Sulphate—
- cellulose industry in Sweden, (49) 22.
 - determination in sulfonated oils, (44) 10.
 - of ammonia, *see* Ammonium sulphate.
 - of iron, *see* Iron sulphate.
 - of potash, *see* Potassium sulphate.
 - pulp from coniferous wood, (46) 617.
 - waters, effect on concrete tile, (48) 184.
- Sulphates—
- absorption by soils, (42) Calif. 811.
 - and chlorides, comparison, (45) 521.
 - determination, (41) 205, 411, 505; (42) 207, 313, 413; (47) 609.
 - double salts of calcium and potassium, equilibrium concentration, (43) 25.
 - effect on soil solubility, (41) Mich. 512.
 - effect on starch, (47) 128.
 - fertilizing value, (41) 427.

Sulphates—Continued.

- in soil, changes in, (48) Fla. 215.
- loss from soil, factors affecting, (50) 521, 523.
- relation to plant growth, (46) 123.

Sulphids—

- dry, and lime-sulphur, comparison, (46) Mass. 50.
- in peat soils, (48) 423.

Sulphite—

- pulping process, modification, (46) 808.
- waste liquor, alcohol from, (43) 416, 617.
- waste liquor, utilization, (42) 615.
- waste liquors, fertilizing value, (48) 123.

Sulphites, effect on sugar beet juice, (43) 207.

Sulphites in foods, test, (48) 12.

Sulphocyanic acid in plants, (44) 825; (48) 727.

Sulphoichthyolate preparations, (41) 781.

Sulphonaphthalein indicator, new, (47) 609.

Sulphur—*see also* Lime-sulphur.

- action as fungicide, (45) 143.
- ammonium wash, preparation and use, (41) 751.
- and soil acidity, (50) 123.
- as factor in soil fertility, (47) 21.
- as fertilizer for cotton, (49) 33.
- as fertilizer for wheat, (45) 426.
- as oligodynamic substance, (48) 24; (49) 421.
- as soil disinfectant, (42) 718.
- atomic, fungicidal value, (41) 657.
- availability, effect of liming, (46) 24.
- bacteria, relation to hydrogen sulphid, (44) 133.
- carriers in fertilizers, necessity of, (48) 195.
- composting with phosphate rock, (42) Va. 429; (44) 217; (48) 219.
- composts, relation to plant nutrition, (45) 25.
- compounds—
 - analyses, (44) N.J. 440.
 - determination in dry lime-sulphur, (50) 107.
 - dry, use against San José scale, (49) 452.
 - effect on cement, (48) 487.
 - for control of rust mites, (46) 355.
 - from decomposition of proteins, (49) 502.
 - soluble, analyses, (43) N.J. 37.
 - stimulating effect, (49) 23.
- determination in feeds and feces, (41) 712.
- determination in foods, (41) 505.
- dioxid, effect on soils and crops, (41) 427.
- dioxid for mange treatment, (43) 184.
- dioxid gas for sheep scab, (47) 587.

Sulphur—Continued.

- distribution in protein-free milk, (50) 710.
- dust as insecticide, (50) 844.
- dust, effect on citrus rust mite, (42) 551.
- dust, fungicidal value, (47) 152.
- effect on—
 - alfalfa, (50) 726.
 - alkali, (48) Calif. 515.
 - crops, (46) 717.
 - grape oidium, (43) 657.
 - greensand potash, (41) 799.
 - H-ion concentration of soil, (46) 428.
 - lime requirement of soils, (46) 428.
 - live stumps, (43) 281.
 - mineral phosphate, (41) 131.
 - nitrogen content of legumes, (46) 120.
 - nitrogen loss in composts, (49) Ga. 516.
 - organic matter in manure, (45) 26.
 - potato scab, (45) 650.
 - rock phosphate, (42) 429.
 - soil fertility, (48) Ky. 117.
 - soils, (41) 427.
 - sulphate leachings, (50) 523.
- elemental, oxidation, (45) 332.
- excretion as index of fatigue, (44) 864.
- experiments, (49) Ohio 625.
- experiments for potato scab, (44) 646.
- Fellowships of National Research Council, (46) 899.
- fertilization, value, (47) 818.
- fertilizers, effect on root system, (42) Oreg. 222.
- fertilizing action, (45) 332, 729.
- fertilizing action on grapes, (42) 222.
- fertilizing value, (41) 427; (42) Oreg. 221, 525, 536, Calif. 812; (44) 129, 423, Oreg. 719, Oreg. 815, Oreg. 818; (45) 26; (46) 120, Wash. 427, 428, 822; (49) 22, Wash.Col. 215; (50) 220.
- flowers of, use as solid lubricant, (49) 888.
- for hant control, (47) 245; (50) Calif. 44.
- for neutralizing alkali soil, (45) 625.
- for potato scab, N.J. (46) 549; (48) 348, 349.
- from waste sulphite liquor, (42) 615.
- fumes, effect on trees, (46) 454.
- fumigation for mealybug, (42) 649.
- fumigation with, (47) 156.
- fungicides, action, (49) 48, N.H. 349.
- fungicides, toxicity, (47) N.H. 243.
- in apple tree wood, (48) Mo. 635.
- in biological material, determination, (50) 612.
- in chick feed, value, (45) Ind. 172.
- in organic compounds, (49) 203.
- in phosphatic slag, (43) 127.

Sulphur—Continued.

- in plants and soils, Ky. (43) 324; (49) 516.
- in proteins, (47) 310.
- in rain water, (46) 16; (48) 823; (49) Ill. 315, 413.
- in sewage, (50) 488.
- in soil and organic matter, correlation, (49) 315.
- in soil, effect on crops, (46) 428.
- in soil, notes, (49) 727.
- in soil, relation to plant nutrition, (49) 420.
- in tomatoes, (49) 436.
- in urine, determination, (47) 612.
- industries in Southern States, (42) 525.
- inoculated as plant-food solvent, (45) 27.
- inoculated, experiments with, (49) Va. Truck 347.
- inoculated, for potato scab, (47) 353.
- insecticidal value, (44) U.S.D.A. 162.
- lead arsenic mixture, insecticidal value, (45) 45.
- metabolism, (43) 663; (47) 167; (48) 464.
- new application in plant culture, (49) 839.
- nutrition of fungi, (49) 26.
- oxidation—
 - as affected by initial reaction, (44) 218.
 - by microorganisms, (46) 822; (49) 625, 818.
 - chemistry of, (47) 27.
 - effect on soy beans and soil bacteria, (48) 723.
 - for improving alkali soils, (50) 726.
 - in Oregon soils, (48) 723.
 - in soils, (47) 219, 220.
 - in soils, mechanism, (48) 422.
 - microorganisms in, (47) 620, 621; (48) 816.
 - relation to potassium availability, (48) 724.
 - studies, (49) Oreg. 514; (50) 725.
- oxidizing bacteria, growth and respiration, (50) 517.
- oxidizing organisms, action on iron sulphid, (48) 427.
- production and trade, (48) 623.
- products, commercial, tests for San José scale, (44) Tex. 756.
- recovery, (45) 216.
- relation to soil fertility, (43) Ill. 517; (50) Oreg. 724.
- removal from soil, (46) N.Y. Cornell 211; (47) Ky. 122.
- requirements of Texas soils, (48) Tex. 517.
- significance to agriculture, (50) N.J. 20.
- solutions, method of analysis, (42) 110.
- spray mixtures, experiments, (49) 235.
- studies, data, (49) Oreg. 510.

Sulphur—Continued.

- toxic property, (50) 345.
- transformation in soil, (48) 516.
- treatments, effect on soils, (50) 725.
- urinary, of fasting steers, (49) 370.
- use against rust mite, (44) 858.
- use on soils, (44) Mich. 129.
- value for potato scab, (46) 649; (50) 653.
- value in controlling mites, (49) 660.
- value on swamps, (43) Oreg. 22.
- Sulphur-arsenate, fungicidal value, (43) 352.
- Sulphuration as treatment for mange, (43) 184; (47) 587.
- Sulphur-floats-soil mixtures—
 - building up, (49) 624.
 - sulphur oxidation in, (47) 219, 220; (48) 822.
- Sulphuric acid—
 - as preservative of liquid manure, (42) 326, 721.
 - color reaction for liver oils, (48) 758.
 - concentrated, apparatus for dispensing, (49) 504.
 - determination, (45) 614.
 - effect on alkali soils, (42) Calif. 813.
 - effect on assimilation in plants, (42) 335.
 - effect on soils, (41) 427.
 - effect on swine, (42) 266.
 - for Cuscuta control, (44) 833.
 - for forest seed treatment, (47) 154, 241.
 - free from nitrate, examination, (44) 9.
 - in leaves, relation to smoke injury, (45) 426.
 - in rain water, (44) 430.
 - production and trade, (46) 430; (48) 623.
 - production, mechanism, (47) 27.
 - sprays for weed eradication, (49) 738.
 - test for liver oils, (49) 410, 611.
 - titration curves for, (48) 710.
 - use to prevent nitrogen loss from manure, (44) 817.
- Sulphurous acid—
 - determination, (41) 112; (46) 415, 805.
 - effect on sugar beet juice, (43) 207.
 - utilization in superphosphates, (42) 126.
- Sumac—
 - diseases, new, in Italy, (43) 49.
 - feeding value, (47) N.Mex. 669.
 - leaves, reddening of, (43) 49.
 - oil from, (41) 710.
 - psyllid in New Jersey, (41) 549.
 - smooth, organic acids of, (46) 308.
 - sorgo, irrigation water requirements, (47) Kans. 630.
- Sun as source of power, (43) U.S.D.A. 117.
- Sunflower—
 - and corn plants, comparative composition, (45) 168.
 - and corn silage, feeding value, (48) 398.

Sunflower—Continued.

- ashes, analyses, (43) 324.
- beetle, notes, (50) 151.
- beetles in Manitoba, (47) 854.
- disease, inoculation experiments, (49) Colo. 441.
- disease, new, (47) 544.
- diseases, (45) Wash. 435.
- grafts on Jerusalem artichoke, (48) 221.
- grafts, studies, (50) 224.
- green shoots, vitamin A content, (46) 357.
- heads denuded of seed, feeding value, (42) 369.
- maggot, notes, (49) 848.
- oil, drying tendencies, tests, (42) 591.
- rust, biologic forms, (50) Minn. 144.
- rust, studies, (50) Minn. 654.
- Sclerotinia disease, (48) 242.
- seed and oil, composition, (45) 720.
- seed cake, feeding value, (42) 369.
- seed, feeding value, (46) Mo. 363.
- seed oil, composition, (48) 607.
- seeds, iron and manganese in, (49) 202.
- seeds, oil from, (41) 209.
- silage—
 - acid content, (42) 469.
 - and alfalfa hay, comparison, (43) Mont. 68.
 - as poultry feed, (43) Minn. 674.
 - composition and digestibility, (43) Mont. 69, Mont. 770; (45) Wash. 269, Okla. 373.
 - digestibility, (45) 169, Wash. 471.
 - feeding value, (43) Mont. 68, Mich. 677; (45) 72.
 - for beef calves, (44) Mont. 364.
 - for dairy cows, (45) Colo. 274, 275, U.S.D.A. 576.
 - palatability tests, (45) 374.
 - quality and composition, (45) Mont. 871.
 - v. corn silage for milk production, (45) Wash. 275.
 - v. darso silage for baby beef, (45) Okla. 375.
 - variations in, (45) 577.
- stem rot, (47) 354.
- v. oat-and-pea silage, (47) Wyo. 572.
- wilt, description, (49) Mont. 148.
- wilt, studies, (50) Mont. 143.

Sunflowers—

- analyses, (50) Oreg. 7.
- and corn, growth, (48) N.Dak. 30.
- as affected by sulphur, (50) Oreg. 724.
- as chinch bug control crop, (49) Ill. 431.
- as corn substitute, (47) N.H. 428.
- as farm crop, (45) 636.
- as forage crop, (41) N.Mex. 139; (43) 527.
- as phytometers, (41) 327.

Sunflowers—Continued.

- as silage crop, (41) Nev. 227, 732; (42) Wash. 828; (43) U.S.D.A. 435, Minn. 636; (44) Wis. 227, U.S.D.A. 732; (45) Wis. 228; (46) N.H. 367; (47) U.S.D.A. 136, Ohio 171, 278; (49) Wis. 630.
- as source of potash, (41) 818.
- breeding experiments, (50) Can. 433
- changes in composition, (49) 770.
- cost of production, (50) Can. 592.
- culture, (42) Minn. 825; (43) 638; (44) 138, Alaska 522; (45) N.Dak. 734, Can. 824.
- culture and use, (47) Wyo. 135.
- culture and use in Uruguay, (45) 35.
- culture experiments, (41) 230, 333; (42) N.Dak. 732; (43) Mont. 35; (44) Alaska 328, Mont. 331, N.Dak. 524, Mich. 530; (45) Kans. 33, Idaho 223; (47) Wis. 431, Alaska 527, Nev. 737; (48) Can. 450; (49) Can. 734.
- culture on peat soil, (46) 216.
- effect on following crop, (47) Wyo. 131; (49) 231.
- endurance of high temperature by embryos, (50) 325.
- fertilizer experiments, (42) Minn. 826; (46) Mich. 518; (49) Can. 734.
- for silage, culture and value, (45) Wash. 434.
- for silage, seeding, (49) Idaho 732.
- for silage, variety tests, Can. (49) 734; (50) 432.
- germination as affected by organic substances, (41) 523.
- growth and variability in, (44) 220.
- growth studies, (42) Calif. 823.
- hybridization, (41) 727.
- in Manitoba, insects affecting, (47) 854.
- nutritive value, (47) Calif. 668.
- returns from, in Georgia, (49) 90.
- rotation experiments, (42) 230; (47) Minn. 121.
- Russian, as honey plant, (47) Okla. 856.
- Russian, as silage crop, (43) Nev. 229; (44) U.S.D.A. 136.
- Russian, culture and feeding, (46) N.Mex. 135.
- Russian, seeding experiments, (47) West.Wash. 433.
- Russian, yields, (47) Nev. 131.
- rust-resisting, (42) Mich. 635.
- seed production, (46) Mont. 327.
- seeding experiments, (46) Mont. 327; (48) Minn. 332; (49) Mont. 129, Wyo. 429, Can. 734; (50) Can. 533.
- selection experiments, (44) Mont. 331.
- spacing experiments, (48) Can. 31; (49) Wash.Col. 223.
- studies, (47) 38.
- time of cutting tests, (49) Can. 734.

Sunflowers—Continued.

- time of harvesting for silage, (45) 169.
- varieties for oil production, (44) 138.
- varieties for silage, (42) U.S.D.A. 337.
- variety tests, (42) N.Dak. 732; (46) 227; (47) Alaska 527; (48) Can. 227; (50) Mont. 133, Can. 533.
- water requirements, (45) Nebr. 531.
- wild, as silage crop, (43) 677; (46) Kans. 478.
- yields, (44) N.Dak. 30; (48) Calif. 527.

Sunlight—

- as cure and prevention of rickets, (46) 165; (47) 66, 67, 270, 271, 566, 770; (48) 65, 66, 365.
- bactericidal action, (41) 681.
- effect on—
 - blister rust fungus, (43) Can. 754.
 - geotropic reactions in plants, (48) 429.
 - growth and composition of plants, (49) 739.
 - legume bacteria, (47) 216.
 - mold spores, (47) 784.
 - nodule bacteria, (49) Wash.Col. 223.
 - rachitic changes in bones of children, (50) 63.
 - xerophthalmia, (50) 61.
- engineering for detached buildings, (44) 486.
- measurement, (44) 131.
- relation to aldehyde production by chlorophyll, (41) 133.
- relation to colorants of green leaves, (42) 730.
- relation to plant development, (48) U.S.D.A. 113.
- rôle in forest insect control, (43) 560.

Sunshine—

- and cloudiness in Canal Zone, (43) U.S.D.A. 718.
- effect on citrus fumigation damage, (44) U.S.D.A. 250.
- efficiency in hog houses, (46) 99, 891.
- geographic distribution in United States, (43) U.S.D.A. 116.
- in United States, bibliographic note, (42) U.S.D.A. 620.
- norms of Brazil, (49) 615.
- variation in California, (43) U.S.D.A. 509.

Sunspot period, relation to rainfall period, (49) 615.

Sunspots—

- and weather, (45) 617.
- frequency tables, (44) U.S.D.A. 121.
- relation to climate, (50) 315.
- relation to rainfall, (46) 209; (47) U.S.D.A. 414, 616, 629.
- relation to temperature, (49) U.S.D.A. 718.
- relation to tropical droughts, (44) U.S.D.A. 415.

Superfecundation, notes, (44) 174.

Superphosphate—

- ammoniated, fertilizing value, (50) U.S.D.A. 621.
- and ammonium sulphate, fertilizing value, (48) 434.
- and ammonium sulphate mixtures, setting of, (41) 425.
- and lime nitrogen mixtures, experiments, (42) 329.
- as manure preservative, N.Y.State (48) 20, 21.
- bisulphate, (41) 723.
- double, analysis, (50) 196.
- effect of pulverized limestone on, (43) 27.
- effect of weather exposure, (46) 219.
- effect on—
 - acid soil, (44) 125.
 - active aluminum, (50) R.I. 17.
 - alfalfa, (49) Mich. 431.
 - composition of soil extracts, (43) Mich. 124.
 - indigo, (47) 826.
 - lime requirements of soil, (44) Pa. 723.
 - lime-magnesia ratio, (47) Va. 624.
 - pH of soil, (47) 513.
 - potash solubility, (41) 126.
 - seed germination, (44) Va. 721.
 - soil reaction, (48) 216.
 - sweet clover, (47) Ohio 136.
 - tobacco root rot, (43) 447.
 - tomatoes, (44) U.S.D.A. 441.
- fertilizing value, (41) Ark. 130, 228. 229, Ala.Col. 336, 516, 814; (42) Guam 37; (43) Tex. 33, Tex. 37. Wis. 336; (44) 319; (45) Mo. 24. Miss. 37, Ohio 119, Pa. 215, Ohio 232, Ohio 233, 623; (47) Minn. 121. Ind. 140, Mich. 143, R.I. 145, 512; (48) Ga.Coastal Plain 129; Minn. 321, Minn. 322; (49) Guam 427. Kans. 427, Tex. 436, Ohio 724; (50) Minn. 120, Minn. 121.
- for alfalfa, (41) Kans. 33.
- for grain in Minnesota, (41) 425.
- industry, use of raw materials, (50) 424.
- manufacture, (41) 628; (46) 627.
- manufacture and distribution, (42) 522.
- manufacture, use of organic wastes in, (42) 814.
- manufacture, use of sodium bisulphate in, (46) 718.
- production, (43) 629; (49) 624.
- production—
 - and sale, (46) 430.
 - in United States, (45) 730.
 - Lipman process, (48) 822.
 - on the farm, (43) Ky. 324.
- reaction with calcium carbonate, (41) 720.
- residual effect of, (42) 23.
- retail prices, U.S.D.A. (42) 219, 331.

Superphosphate—Continued.

reverted, fertilizing value, (43) 428.
treble, fertilizing value, (50) Minn. 120.

use in conservation of liquid manure, (42) 326, 721.

v. phosphatic slag, (43) Ohio 324.

Superphosphates—

action in different soils, (44) 627.

analyses, (44) Ky. 516.

insoluble phosphoric acid in, (50) 712.

reversion, cause, (44) 23.

reversion in acid soils, (50) 218.

Supra phosphate, fertilizing value, (49) 816.

Suprarenal gland, effects of inanition on growth, (42) 666.

Suprarenals—

adrenalin content, (42) 665.

relation to ovulation, (48) 167.

rôle in vitamin B deficiency, (50) 859.

transplantation into doves, effect, (50) 826.

Surgery and medicine, industrial, (43) 564.

Surra—

and biting flies, (47) 358.

in camels, ponies, and buffaloes, (45) 887.

in camels, studies, (48) 179.

in camels, treatment, (43) 584; (46) 777.

transmission, (46) 881; (48) 482; (49) 156, 157, 158.

Surveying—

and boundaries, laws, treatise, (49) 483.

for settlers, handbook, (49) 384.

Swainsona affinis, feeding experiments, (48) 168.

Swamp and overflowed lands, reclamation, (46) 381.

Swamp drainage, dynamite for, (41) 483.

Swamp fever—*see also* Anemia, infectious.
cause, (47) 588.

in horses, N.Dak. (43) 386; (45) 286.

in horses, transmission, (45) Wyo. 478.

in Wyoming, (41) Wyo. 478.

insect transmission, (48) Wyo. 283.

intestinal worms in, (42) 678.

occurrence, (47) Wis. 482.

studies, (43) Wyo. 179.

transmission, paper on, (42) 678.

transmission, rôle of bloodsucking insects in, (47) 588.

virus carrier, history, (50) N.Dak. 80.

virus, dialyzing experiments, (48) N.Dak. 81.

Swamp soils—

culture experiments, (41) Minn. 387.

effect on composition of crops, (41) 422, 813.

Swamp soils—Continued.

fertilizer experiments, (41) 813.

in United States, (41) U.S.D.A. 693.
management, (41) 624.

Swamps—

mangrove, in Philippines, (42) 142.

peat, reclamation, (43) Ore. 21.

reclamation, (42) 813.

reclamation, use of tractors in, (43) 484.

Swans, North American, life histories, (49) 756.

Sweat, H-ion concentration, effect of work and heat on, (42) 465.

Sweating, effect on hemoglobin and protein content of blood, (43) 265.

Swede—

clubroot, resistant varieties, (49) 148, 445.

diseases, notes, (43) 45; (48) 146.

dry rot, studies, (41) 657; (43) 244; (45) 449, 651; (48) 49.

juice, raw, antiscorbutic value, (43) 667.

juice vitamin C as affected by heat, (43) 567.

Swedes—

analyses, (43) 63.

antiscorbutic value, (41) 860.

as affected by potassium salts, (43) 630.

as affected by sodium chlorid, (43) 630.

as forage crops in Denmark, (43) 177.

breeding experiments, (45) 822; (48) 434.

culture, (41) Minn. 387; (42) Wyo. 135; (47) Minn. 334; (48) N.Dak. 224; (49) Wis. 630.

culture and storage, (45) Wis. 229.

culture experiments, Alaska (44) 329; (49) 426.

culture on peat soil, (43) 23.

effect on following crops, (44) R.I. 33.

Erysiphe polygoni on, (45) 351.

fertilizer experiments, (42) Minn. 826;

(43) 627; (46) 131; (47) 121.

following different crops, (44) R.I. 33.

harvesting, (49) 86.

manuring experiments, (43) Minn. 627.

nutritive value, (41) 557; (47) Calif. 668.

rotation experiments, (50) R.I. 520.

seed production in Denmark in 1918, (42) 135.

sodium for, (41) R.I. 426.

storage experiments, (48) Calif. 529.

time of sowing, (41) 234.

varieties, yields, (47) Mont. 131.

variety tests, (42) Minn. 824; (44)

R.I. 32; (45) 830; (46) 227, N.H.

328; (47) Minn. 332, Calif. 631;

(48) Can. 31, Can. 227, Minn. 331;

(49) Can. 734; (50) 133, Can. 432,

Can. 533.

yields, (43) Minn. 824.

Sweeping—

energy expenditure during, (44) 66.
increase in metabolism during, (42) 167.

Sweet clover—

analyses, (45) Kans. 33; (50) Oreg. 7.
annual white, culture, (41) Hawaii 138, Idaho 225, Iowa 227; (44) 796; (46) Mont. 327.
annual white, growth, habits, and uses, (45) U.S.D.A. 132.
annual white, notes, (46) Iowa 326.
as affected by aluminum salts, (44) 125.
as affected by calcium, (46) Ky. 816.
as affected by phosphatic fertilizer, (47) Ohio 136.
as dry farm crop, (43) Ariz. 733.
as farm crop, (45) 830.
as forage crop, (44) Utah 525; (46) Mass. 30.
as green manure, (44) Del. 431; (45) Ill. 516; (48) N.Dak. 226; (49) Ill. 315.
as green manure or summer pasture, (49) Md. 334.
as hay and forage, (43) 527.
as hog pasture, (41) U.S.D.A. 72.
as pasture crop, (41) Nebr. 434.
as stock feed, (44) Hawaii 30.
barium in, (46) Colo. 28.
biennial white, culture, (47) Mich. 435.
clipping and seed production, (49) Ky. 525.
cultural directions, (45) N.Dak. 225.
culture, (43) Nebr. 637; (45) N.Dak. 734, Ariz. 740; (46) Tex. 328; (47) Idaho 231; (49) Md. 334.
culture—
and uses, papers on, (44) 232.
experiments, (41) Idaho 225, N.Dak. 824; (42) N.J. 827; (43) Mont. 332, Idaho 738; (44) Iowa 431, N.Dak. 524, Oreg. 826; (45) Mo. 224; (47) Wis. 431; (49) Tex. 429; (50) Minn. 133, Alaska 532.
for hay and seed, (45) Mich. 636.
in Ontario, (49) 230.
on prairies in Canada, (41) 732.
on sandy soils, (41) Wis. 18.
cutting at different heights, (41) N.Dak. 140.
damaged, disease due to, (50) 878.
effect of fineness of limestone, (45) 624.
feeding, disease due to, (48) 777.
feeding, effect on milk, (49) 375.
fertilizer experiments, (43) Ky. 331; (46) Mich. 518.
for improvement of native pasture, (41) Kans. 35.
green manuring experiments, (48) N.Dak. 226.
hay, culture experiments, (48) N.Dak. 225.

Sweet clover—Continued.

hay, feeding value, (41) Kans. 71.
hay, tests, (49) Idaho 732.
Hubam—
and biennial, anatomy and cytology, (49) Iowa 731.
as honey plant, (47) Ohio 137, Okla. 856.
as short season hay crop, (47) Mich. 131.
behavior and adaptation, (49) Fla. 824.
breeding experiments, (48) Mich. 224.
chemical composition, (49) Iowa 736.
culture, (47) Mich. 137, Ohio 137.
culture and use in Australia, (47) 227.
culture experiments, (49) Alaska 426.
culture in South Africa, (48) 440.
hay, protein in, (47) Ohio 137.
height and time-of-cutting test, (47) Iowa 232.
history and distribution, (47) Iowa 232.
seed production, (45) Mich. 435.
v. biennial white, (47) Idaho 231, Iowa 232.
value, (48) Del. 632.
variety tests, (49) Iowa 732.
Hughes annual, (44) Mich. 195.
in Saskatchewan, (47) 828.
inoculation, (41) 523; (48) Wash.Col. 832.
mosaic, notes, (46) 848; (48) 243.
natural inoculation, (45) Colo. 213.
nurse crops for, (49) Can. 734.
oats as nurse crop, (41) Mo. 637.
on fall plant sugar cane, (50) La. 33.
pasture for dairy cows, (45) U.S.D.A. 576.
pasture, value, (47) Mich. 176.
poisoning, (49) 178.
pollination studies, (43) 640.
root rot, (41) Ariz. 345.
rotation experiments, N.Dak. (43) 332; (45) 216.
seed—
coats and delayed germination in, (49) Iowa 731.
coats, studies, (43) U.S.D.A. 640.
identity, (46) 732.
production, nurse crop for, (48) N.Dak. 29.
production, pollination studies, (43) U.S.D.A. 640.
scarification, (44) Wis. 226; (47) Ohio 136.
screenings, effect on sheep, (43) U.S.D.A. 464.
seeding experiments, (41) N.J. 35, Nebr. 434; (43) Okla. 33; (44) Kans. 224; (45) Idaho 222, N.Dak. 225; (48) N.Dak. 29, N.Dak. 224; (49) Okla. 428, Idaho 736.

Sweet clover—Continued.

- silage, preparation, (41) N.Dak. 140.
- silage, studies, (41) Mo. 334.
- stand and yield, factors affecting, (49) 230.
- sun-cured, protein content, (44) Kans. 224.
- use in orchards, (42) Minn. 834.
- varieties, (46) Mich. 633.
- varieties for South Dakota, new, (42) S.Dak. 827.
- variety tests, (42) Minn. 824; (49) N.Mex. 525, Can. 734.
- water as limiting factor, S.Dak. (42) 827; (45) 435.
- white—

- and yellow, analyses at different stages, (49) 771.
- as affected by wet conditions, (41) N.Dak. 140.
- culture, (44) Hawaii 29.
- culture experiments, (41) Ariz. 332; (45) Kans. 33.
- pasture for cows, (44) Kans. 271.
- yields, (48) Calif. 527.

Sweet corn—*see also* Corn.

- as silage crop, (44) Ariz. 523.
- breeding experiments, (44) Wis. 226, 533; (48) Can. 38; (49) Wis. 630; (50) P.R. 540.
- canned, quality in, (50) 741.
- canning, (43) Ind. 34.
- canning stage, forecasting, (49) Md. 832.
- canning, temperature changes in, (45) U.S.D.A. 560.
- changes during ripening, effect of temperature, (45) 134.
- cost of production, (45) Ohio 134; (48) N.Y.Cornell 787.
- culture, (47) La. 438; (48) Minn. 338.
- culture experiments, (44) Alaska 329; (48) V.I. 340.
- culture in high altitudes, (49) Mont. 832.
- dehydration, methods, (47) 206.
- disease-free seed selection, (43) Ind. 34.
- effect of liming, (46) N.H. 318.
- effect of topping, (49) Iowa 740.
- fertilizer experiments, (44) R.I. 22; (49) Ohio 337.
- from selfed and cross-pollinated seed, (47) Wis. 438.
- Fusarium diseases, (41) Minn. 745.
- in water culture, equilibrium concentration, (41) 132.
- infection, studies, (48) Del. 643.
- manuring experiments, (46) N.H. 318.
- mulching experiments, (49) Ohio 337.
- quality as affected by temperature, (42) 38.
- ripening stages, nail test for, (45) 834.
- root rot, studies, (43) Ind. 345.
- seed, analyses, (47) Conn.State 570.
- seed, parasite of, (44) 344.

Sweet corn—Continued.

- seed production, (43) Md. 133; (45) Ind. 134; (49) Ind. 531.
- seed selection, (43) Ind. 339.
- seeding depths and suckering, (41) N.J. 42.
- Stewart's disease of, (45) 352.
- suckering experiment, (44) N.J. 337; (47) N.H. 437.
- suckering, value, (47) 237.
- sugar loss in storage, (41) 646.
- tests, (50) Mont. 139.
- varieties, (50) Mont. 139, Can. 339.
- variety tests, (41) N.Dak. 147; (42) Minn. 835; (43) U.S.D.A. 437; (44) R.I. 32, Mont. 337, Iowa 432, U.S. D.A. 441; (45) N.Dak. 235; (48) P.R. 227; (49) Mont. 136, 329.

Sweet gum trees, time for transplanting, (43) Mo. 142.

Sweet pea—

- bud drop, studies, (45) 851.
- diseases, (48) Can. 144.
- germination, studies, (45) Ind. 134.
- powdery mildew, notes, (45) 851.
- stem rot, notes, (45) 843.
- wilt, cause, (49) 648.
- wilt, notes, (50) 547.

Sweet peas—

- cross-inoculation tests, (41) 523.
- culture, (49) Alaska 435.
- culture, treatise, (43) 441.
- germination as affected by organic substances, (41) 523.

Sweet potato—

- black rot, control, (46) 551.
- black rot, studies, (49) Miss. 441.
- caterpillar, notes, (41) Fla. 548.
- curing houses, plans, (47) 688.
- diseases, (42) U.S.D.A. 48, 542; (43) 152, 243; (45) N.J. 354; (46) 543; (48) N.J. 49, N.J. 350; (50) 136, 551.
- diseases, control, (42) Tex. 745, N.C. 896; (44) N.J. 341; (45) Miss. 52; (46) 551.
- flour, manufacture, (45) 416.
- Fusarium wilt, notes, (47) Calif. 646.
- gall disease, (43) 151, 152.
- Java black rot, cause, (49) Tex. 442.
- juice, antiscorbutic value, (47) 568.
- leaf beetle, (44) 354.
- leaf spot, notes, (47) 348; (48) 842, 843.
- leaves, vitamin in, (46) 667; (49) 563.
- meal, preparation, (41) 65.
- mealybug, notes, (41) 756.
- mosaic disease, (42) 246; (44) Ark. 345.
- pomace, composition, (49) U.S.D.A. 507.
- pox, cause, (48) Del. 642.
- pox, control, (47) N.J. 448.
- pox, studies, Del. (44) 444; (45) 646; (46) 646.

Sweet potato—Continued.

- quarantine, (44) 249.
- rot, notes, (48) 547.
- scurf or soil stain, (47) N.J. 448.
- sirup, production, (44) 615; (45) 416;
(49) U.S.D.A. 506.
- starch, notes, (48) Hawaii 310.
- stem rot and tomato wilt, (45) 545.
- stem rot, notes, (50) 749.
- storage diseases, Tex. (42) 787; (46) 343.
- storage rot fungi, glucose as source
of carbon, (45) 354, 355.
- storage rots, control, (45) Miss. 52.
- surface rot, control, (43) 752.
- vines, analyses, (49) La. 272.
- vines, palatability of silage from, (49)
Ga. 524.
- weevil—
 - control, 43) Ala.Col. 57, 258; (44) 753; (45) 363; (49) La. 855.
 - eradication in Florida, (46) U.S. D.A. 462.
 - in Florida, (47) 658.
 - notes, (42) 545; (48) U.S.D.A. 52, 153; (50) Tex. 759.
 - papers on, (48) 852.
 - West Indian, notes, (45) V.I. 150.
- wilt, notes, (44) 642.
- worm, notes, (43) 252.
- yellows or stem rot, control, (47) N.J. 448.

Sweet potatoes—

- acreage and planting time, (44) P.R. 433.
- as affected by lime, (47) Md. 235.
- as affected by *Rhizopus tritici*, (45) 749, 750.
- breeding experiments, (43) 637; (46) S.C. 725; (48) S.C. 629; (49) 735; (50) S.C. 637.
- bud mutation in, (50) V.I. 533.
- canned, discoloration in, (46) 15.
- canning, U.S.D.A. (45) 560; (46) 664; (47) 613.
- culture, (43) N.J. 140; (44) Hawaii 29, 827; (45) Mo. 42, Miss. 126; (46) Ala.Tuskegee 730; (47) Miss. 38, Miss. 428; (50) Hawaii 136.
- culture—
 - experiments, (41) 729; (44) 433; (45) 340; (46) Guam 726; (48) Ga.Coastal Plain 628.
 - handbook, (44) 832.
 - heated hotbeds for, (47) Ala.Col. 337.
 - in Arkansas, (44) 438.
 - in Georgia, (44) 636.
 - in Montserrat, (41) 825.
 - in Texas, (41) 644.
- curing and storage houses, (47) U.S. D.A. 635.
- decaying, acids produced by, (50) 21.

Sweet potatoes—Continued.

- fat-soluble vitamin in, (42) 556.
- feeding value, (49) 470.
- fertilizer experiments, (41) Fla. 527; (43) Ga. 139, Fla. 335, 637; (44) S.C. 525; (45) Miss. 223, Tex. 435; (47) Ga. 427, Miss. 428, Ark. 734; (49) Miss. 222, Md. 333, Ga. 524.
- field tests, (41) 825.
- grades, (43) U.S.D.A. 336.
- hardening process in, (46) Mo. 827.
- harvest and storing, (50) Ala. 337.
- hogging down, (49) La. 272.
- improvement by selection, (45) 228; (46) 830.
- insects affecting, (41) 455; (43) 450; (44) 57; (47) 551; (48) 153.
- inspection service in Mississippi, (47) 552.
- keeping quality, (46) 135.
- losses in transit and storage, (45) 849.
- maltose formation in, (50) 711.
- manuring experiments, (45) V.I. 127.
- project study outlines, (44) 596.
- recipes, (46) Ala.Tuskegee 730.
- residue, feeding value, (48) Hawaii 368.
- Rhynchophora* on, (43) 163.
- rotation experiments, (42) 230; (43) Fla. 335.
- seed stock, storing and bedding, (47) Va.Truck 828.
- selection experiments, (41) 636.
- shape, effect of fertilizers, (50) 300.
- soft rots, (49) 754.
- spacing experiments, (49) Miss. 222.
- statistics, (42) U.S.D.A. 731.
- storage, (41) Ariz. 338; (42) Tex. 787; (43) Ga. 140, N.J. 140; (44) Ariz. 529; (45) Del. 690; (46) 226; (47) U.S.D.A. 435; (48) Ariz. 435.
- storage—
 - and curing houses, (44) 637.
 - and marketing, (43) 243; (50) 551.
 - flue-heated tobacco barns for, (47) U.S.D.A. 688.
 - houses, (41) 488.
 - in Texas, (48) 386.
 - rots, control, (46) 551.
- treatise, (50) 136.
- treatment with mercuric chlorid, (45) 651.
- v. cassava meal for pigs, (43) 71.
- varieties, (48) P.R. 227; (50) Miss. 828.
- varieties—
 - canning qualities, (47) U.S.D.A. 613.
 - classification, (50) 336.
 - classification and descriptions, (48) U.S.D.A. 134.
 - susceptible to *Rhizopus*, (47) 151.

Sweet potatoes—Continued.

- variety tests, (41) 825; (42) 230; (43) U.S.D.A. 330; (45) Guam 34, Mo. 42, Miss. 126, Miss. 223; (46) 226, Hawaii 633; (47) Miss. 428, Ark. 734, Miss. 831; (48) Ga.Coastal Plain 129, Hawaii 330, S.C. 629; (49) Miss. 222, Guam 427, Miss. 428; (50) 28, U.S.D.A. 132, P.R. 533, V.I. 533.
- vitamins in, (48) 826.
- white, vitamins in, (47) 465.
- wound-cork formation in, (45) 750.
- yield correlation of parent hill and offspring plantings, (41) Fla. 528.
- yields in New Jersey, (46) 225.

Swietenia—

- candollei n.sp., description, (42) 642.
- cirrhatta n.sp., description, (43) 241.
- species, revision, (43) 241.
- spp., descriptive accounts, (41) 541.

Swine—see also Pigs.

- anatomy, (44) 481.
- bleeding for blood tests, (44) 578.
- blood, sodium content, (45) 112.
- breeders' associations, (47) 76.
- breeding in Catalonia, (47) 866.
- breeding, seasonal distribution, (43) 377.
- common animal parasites, (49) Ill. 481.
- diseases, (43) Ind. 384; (46) Ky. 883; (47) 283; (49) U.S.D.A. 787.
- diseases—
 - affecting reproduction, (43) 683.
 - Bacillus botulinus* in, (47) 680.
 - blackleg and bradsot-like, (45) 182.
 - control, (48) 277.
 - diagnosis, (45) 77, 781, 887.
 - infectious, (45) 680.
 - infectious, diagnosis, (42) 381, 877.
 - summary, (48) 81.
 - treatise, (45) 182.
 - value of bacterins in, (47) 283.
- dysentery, Ind. (43) 385; (46) 582.
- effect of inbreeding, (44) Del. 267.
- epizootic among, bacteriological studies, (48) 485.
- erysipelas—
 - bacillus from urticaria, (45) 888.
 - bacillus in lambs, (44) 583.
 - bacillus in poultry, (49) 81.
 - bacillus, studies, (42) 679; (48) 485.
 - immunization, (44) 876.
 - immunization, duration of, (48) 283.
 - immunization of horses, reactions, (49) 482.
 - studies, (42) 78; (43) 785.
- feces, chlorin determination, (42) 506.
- fertility as affected by age, (46) 73.
- fever, occurrence in Great Britain, (46) 178.
- fever, red, immunization, (42) 78.

Swine—Continued.

- fever, red, prophylaxis and treatment, (41) 577.
- husbandry, course in, (46) 898.
- husbandry, treatise, (47) 195.
- in Tunis, (44) 267.
- influenza, (47) 186; (48) 380.
- inheritance of belting spotting, (46) 268.
- international trade, (46) 675.
- lungs, bacteria in, (47) 683.
- management in Idaho, (41) Idaho 273.
- management in the South, manual, (41) 369.
- metabolism as affected by temperature, (48) 872.
- origin of corpus luteum in, (42) 668.
- ovaries, corpora lutea in, (46) 266.
- parasite in Guiana, (47) 86.
- plague—
 - and hog cholera, comparison, (42) 381, 877.
 - etiology and immunology, (48) 777.
 - nomenclature, (44) 781.
 - notes, (43) Ind. 385.
 - paper on, (41) 474; (42) 878.
 - relation to necrobacillosis, (41) 784.
- pneumonia, studies, (43) 688; (46) 83; (47) 684, 884.
- posterior paralysis, (48) 271; (50) 869.
- pox, (45) 881.
- publications and associations, (48) Iowa 373.
- sarcosporidiosis, (48) 182.
- shipments, (45) 680.
- sterility and low fertility in, (50) 870.
- urine, chlorin determination, (42) 506.
- vaccination, care before and after, (47) 283.
- vaccination, methods, (47) 283.
- Swiss chard, aerial fertilization with carbon dioxid, (41) Vt. 833.
- Swiss Dairy Association, report, (50) 781.
- Syagrus fulvitaris*—
 - in Hawaii, (45) 755.
 - notes, (42) 549; (46) 58.
 - parasite of, (48) 158, 857.
- Sycamore—
 - blight, notes, (41) 752.
 - leaves and twigs, feeding value, (45) 774.
 - wood, utilization, (44) U.S.D.A. 149.
 - wood, water conductivity in, (47) 223.
- Sylvanus surinamensis*, control, (45) 359.
- Sylvinit and components, comparison, (49) 817.
- Symbiosis—
 - and parasitism, (46) 655.
 - between a bacterium and a fungus, (42) 350.
 - fungus, in *Casuarina equisetifolia*, (43) 731.
 - in a deciduous forest, (49) 523.

Symbiosis—Continued.

in plants, (49) 819.

studies, (43) 133.

Symbiotes, review of literature, (41) 558.

Symptomatic anthrax, *see* Blackleg.

Synanthedon—*see also* *Aegeria and Sesia*.

acerni, notes, (50) Conn.State 50.

pictipes in South Dakota, (41) 59.

Synapsis, (46) 173.

Syncephalastrum sp. in corn meal, (46) 356.

Synchytrium endobioticum—

distribution in Norway, (49) 645.

history and distribution, (46) 550.

life history and cytology, (44) 646; (47) 248.

notes, (43) 245; (44) 447; (45) 847; (46) 650; (48) 743; (50) 550.

origin, (48) 741.

studies, (45) 51.

symptoms and history, (46) 242.

varietal and species hosts, (49) U.S.D.A. 443.

Synchytrium—

sp., notes, (49) 839.

spp., studies, (42) 46.

vaccinii on cranberries, (45) U.S.D.A. 54.

Syngamus—

bronchialis, studies, (44) 379.

laryngeus in cattle and buffaloes, (43) 688.

trachealis, effect on coagulation of blood, (45) 477.

Synoides, new genus, description, (41) 456.

Synthetic ammonia plants, German and American, (47) 321.

Synthetic milk adapted (S.M.A.) for infant feeding, (42) 660.

Syphacia obvelata, notes, (42) 847.

Syphilis, serum diagnosis, (46) 276.

Syrphid larvae on spinach, (50) 156.

Syrphidae—

biological and taxonomic studies, relation, (49) 848.

notes, (41) 852.

of Colorado, (47) Colo. 458.

of Japan, economic, (41) 461.

Syrphus—

americanus, notes, (41) 852.

ropalus on flax, (45) 551.

spp., notes, (42) 854.

Syrrhizus diabroticae n.sp., description, (47) 260.

Systema basalis, control, (47) 163.

Systema taeniata, notes, (47) N.Y.Cornell 848.

Systemma ulmi, notes, (48) 850.

Tabanid larvae, nutrient agar for, (48) 358.

Tabanidae—

Australian, life history and habits, (46) 248.

early stages, (45) 661.

Tabanidae—Continued.

in Louisiana, (49) 657.

seasonal activity in Everglades of Florida, (42) 158.

Tabanids as hosts of Sarcocystis of bovines, (47) 554.

Tabanus—

albimediis, transmitting surra, (49) 157.

nemocollosus, transmitting surra, (49) 156.

phaenops, notes, (47) Nev. 458.

pumilus, notes, (49) 657.

relation to horse sickness, (41) 879.

septentrionalis as carrier of infectious anemia, (42) 678.

spp. attacking white grubs, (42) 550.

spp., bionomics of, (46) 248.

spp., notes, (50) 358.

spp., transmitting anthrax, (49) La. 881.

spp., transmitting surra, (49) 158.

Table service and etiquette, (49) Ark. 897.

Table utensils as source of tuberculous infection, (48) 659.

Tachardia lacca, studies, (45) 861.

Tachardia larreae in southwestern United States, (41) 457, 757.

Tachina fly, parasitism by, (44) 255.

Tachinid infestation, resistance to, (49) 255.

Tachinidae—

"biological species," (50) 848.

of North Carolina, list, (46) 460.

parasitism by, (44) 57; (45) 655.

Texas, host records, (46) 750.

Tachycines asynamorus, summary, (48) 853.

Tadpoles—

growth and metamorphosis on different diets, (48) 467.

growth as affected by thyroid gland extract, (43) 865.

nutritional studies, (41) 468.

Taenia—

crassicolis, biology of, (49) 76.

perfoliata as affected by thymol, (46) 885.

spp. in frozen meat, (50) 582.

Taeniothrips inconsequens, notes, (44) Oreg. 850.

Taifa, effect on nitrification in soil, (50) 721.

Taftia saissetiae, parasitism by, (45) 663.

Tagasaste, characteristics and uses, (48) 435.

Tagetes erecta, studies, (42) 728.

Talc, use as solid lubricant, (49) 888.

Talinum, culture directions, (45) 35.

Talinum verticillatum leaves, use as a spinach, (48) P.R. 234.

Tallianine, use in treatment of respiratory disease, (41) 283.

Talpa europea, life history and habits, (44) 751.

- Talthib as paper-making material, (41) 732.
- Tamalia, new genus, erection, (43) U.S.D.A. 758.
- Tamarack—
for wood-block pavement, (41) 790.
root habit, (41) 634.
sawfly, parasite, (41) Mich. 660.
swamp, first breaking experiments, (49) 686.
- Tamarind—
antiscorbutic value, (42) 163.
juice, antiscorbutic value, (43) 263.
pod borer, studies, (44) 657.
- Tamarisk, evergreen, introduction, (45) Ariz. 439.
- Tanaomastix abnormis, notes, (43) 660.
- Tanbark industry in Java, (41) 48.
- Tanbarks, sources and uses, (48) 239.
- Tangantangan—
feeding value, (49) Guam 464.
notes, (48) Guam 228.
- Tangelo juice, analyses, (47) Calif. 660.
- Tangelo, new, description, (45) 742.
- Tangelos, analyses, (48) 159.
- Tangelos, variety tests, (47) Calif. 640.
- Tangerine purple scale in Uruguay, (44) 252.
- Tangerines—
antiscorbutic value, (47) 568.
culture, (45) Guam 43.
nematodes affecting, (48) 548.
- Tangle top, analyses, (44) Ariz. 568.
- Tania—*see also* Tannia.
use for greens, (42) 138.
- Tankage—*see also* Garbage tankage.
amino-acid content, (41) 367.
amount for pigs, (50) Can. 776.
analyses, (41) Ind. 564, Can. 565, Ind. 868, N.Y.State 868; (42) Mich. 63, 263, Ind. 769, Tex. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, 867, Ind. 867; (44) Mich. 568, Mass. 671; (45) N.Y.State 469, N.J. 775, 872; (46) Mich. 168, Tex. 675; (47) N.Y.State 172, 275, Ind. 473, Tex. 475, N.J. 571; (48) 68.
and corn, feeding to pigs, (44) Ohio 472.
and corn, feeding value, (50) Miss. 69.
as corn supplement, (42) Kans. 374; (43) Ohio 377.
as protein supplement for pigs, (49) Mich. 469.
as source of protein for egg production, (47) Idaho 870, 871.
as substitute for beef scrap, (49) Can. 70.
digester, analyses, (43) N.J. 672.
digester, low quality of, (49) Ind. 772.
digester, phosphoric acid standard, (41) 564.
digestibility coefficients, (48) 574.
effect on soil acidity, (47) R.I. 519.
- Tankage—Continued.
feeding value, (41) Ky. 74, Mich. 74, Iowa 272, 569, 675; (42) U.S.D.A. 374, Calif. 871, Ohio 871; (44) Del. 366, Del. 367, U.S.D.A. 772; (47) Tex. 474, Wash.Col. 575; (49) Tex. 469, Ind. 571, Idaho 774, N.C. 775.
fertilizing value, (42) Calif. 812; (43) La. 627; (49) 834.
for fattening pigs, (43) Mo. 772.
for laying hens, (41) Ind. 571.
for pigs, optimum amounts, (44) Mont. 367.
long-continued feeding, effect, (47) Okla. 868.
minerals and possible substitutes for, (49) Ohio 371.
preparation and manufacture, (47) Ind. 473.
retail prices, (42) U.S.D.A. 331.
v. cottonseed meal for laying hens, (49) Tex. 470.
v. fish meal, feeding value, (48) Wash. Col. 71.
v. plant proteins for pigs, (45) Ohio 675.
v. semisolid buttermilk for hogs, (45) Nebr. 171.
v. wheat middlings, feeding value, (47) 76.
vitamin in, (50) Ohio 573.
- Tanks, concrete, construction, (43) 188.
- Tanks, welded v. riveted, (50) 888.
- Tannery waste—
fertilizing value, (41) 724.
hydrolyzed, feeding value, (48) Calif. 573.
purification and disposal, (43) 189.
- Tannia meal, preparation, (41) 65.
- Tannias, variety tests, (46) 226.
- Tannic substances, biological significance, (45) 220.
- Tannin—
analyses, kaolin for, (41) 805.
content of New Zealand trees, (41) 710.
extract from grape seeds, (45) U.S.D.A. 209.
formation, (48) 328.
from hemlock bark, (41) 509.
in plant tissue, estimation, (50) 614.
Karaunda, species yielding, (41) 839.
- Tanning—
colloid chemistry, (41) 310, 801.
industry by-products, feeding value, (42) 769.
industry of India, notes, (42) 170.
materials, analysis, (44) 9.
materials, composition and manufacture, (47) 314.
materials, vegetable, value of, (43) 506.
treatise, (47) 509.
- Tanyderidae, studies, (42) N.Y.Cornell 157.

- Tanymecus, notes, (43) 456.
 Tapetum, rôle of, studies, (42) 819.
 Tapeworm cysts in rats, studies, (42) 847.
 Tapeworms—
 in poultry, (41) 685, 881; (44) 379.
 in swine, (45) 888.
 life history, (48) 678.
 treatment, (41) 782.
 viability of larval forms, effect of cold,
 (50) 582.
- Taphrina—
 bussei, notes, (49) 546.
 deformans, notes, (46) 453.
 Swedish species, (43) 242.
- Taphrocercus gracilis, life history, (49)
 N.Y.Cornell 854.
- Tapioca—
 flour, characteristics and detection,
 (41) 467.
 making, (49) 56.
 starch, microphotograph of, (48) 708.
- Tar paint for irrigation structures, (44)
 687.
- Tar preparations, value against Helmintho-
 sporium gramineum, (45) 537.
- Taramira, natural crosses, (44) 329.
- Tares—
 and oats, digestibility and metaboliza-
 ble energy, (48) 167.
 pastured-off, effect on following crop,
 (41) 826.
- Targionia sacchari, notes, (45) V.I. 150.
- Tariff Act, Emergency, of May, 1921, (48)
 892.
- Tarnished plant bug—
 distributor of fire-blight, (46) 348.
 notes, (44) 352; (45) 152, 756; (47)
 N.Y.Cornell 848; (48) 152.
- Taro—
 culture, (44) Hawaii 30.
 culture experiments, Guam (46) 726;
 (49) 427.
 in rotation with rice, (41) Hawaii
 137.
 notes, (48) Hawaii 330.
 residue, feeding value. (48) Hawaii
 368.
 rot, studies, Hawaii. (44) 47; (46)
 647.
 spacing experiments, (50) P.R. 533.
 starch, digestibility, (47) 763.
 variety tests, Guam, (45) 34; (49)
 427.
- Tarsonemid mites, taxonomy and biology,
 (47) 857.
- Tarsonemus woodi in bees, (46) 464, 858.
- Tartar emetic, treatment for surra, (46)
 777.
- Tartaric acid—
 determination in fruit juices, (49)
 805.
 distinction, (44) 113.
 from grape-shoot silage, (41) 618.
 manufacture from grape marc, (46)
 509.
 value for jelly making, (49) Del. 9.
- Tarweeds, inheritance in, (47) Calif. 629.
- Taste, physiology and psychology of, (46)
 563.
- Taurin, determination in muscles, (43)
 506.
- Taxation—
 affecting agriculture, (48) 188.
 problems in science of, (47) 692.
- Taxes—
 and agriculture in France, (46) 894.
 on sales of land and capital goods,
 (46) 894.
 pforessive, on land values, (47) 93.
- Taxonomy, biochemic basis, (42) 224.
- Taxonomy experiments, (49) 29.
- Tché tree, characters and uses, (44) 238.
- Tea—
 adulteration, (41) 467.
 adulteration, detecting, (41) 429.
 analyses, (43) 745; (50) Conn.State
 160.
 analysis, official method, (44) 9.
 black rot, notes, (42) 50; (43) 444.
 blights, notes, (42) 145.
 breeding experiments, (49) 735.
 brown blight, studies, (45) 48; (46)
 448.
 caffeine in, (41) 412; (47) Conn.State
 559.
 capsid, new, (41) 847.
 crop as affected by climate, (45) 617.
 crop, optimum weather conditions,
 (49) 15.
 culture and preparation, (50) 39.
 culture experiments, (41) 242; (45)
 140.
 culture in French colonies, (43) 342.
 culture in Indo-China, (41) 447.
 diseases, (41) 845; (42) 145, 741;
 (46) 845.
 effect on gastric response, (44) 665.
 fertilizer experiments, (42) 22, 123,
 518; (43) 425; (45) 643.
 flower bud bug, notes, (44) 851.
 fungus blights, (47) 754.
 immunity from insect attack, (47)
 357.
 importation and inspection, (50)
 U.S.D.A. 10.
 insects affecting, (41) 455; (43) 252;
 (45) 657.
 inspection, (41) Conn.State 170;
 (47) Conn.State 559; (50) U.S.D.A.
 10.
 inspection and analysis, (45) Conn.
 State 365.
 leaf fungus diseases, (42) 747; (45)
 654; (48) 150.
 leaf gray blight, treatment, (48) 150.
 leaf rollers, studies, (47) 658.
 leaf skeletonizer, (49) 453.
 manuring experiments, (41) 742.
 mosquito blight, notes, (45) 553;
 (50) 249.
 mosquito bug, control, (50) 556.
 oil, detection in olive oil, (44) 613.

Tea—Continued.

- pictorial history, (42) 863.
 - plants, breeding, (45) 630.
 - plants, wild, of Germany, (41) 743.
 - plucking, papers on, (42) 239.
 - production and quality in Mauritius, (43) 745.
 - production in India, (42) 641.
 - pruning experiments, (41) 242; (44) 147.
 - red rust, notes, (42) 747; (45) 843; (48) 351; (49) 45.
 - root diseases, notes, (43) 247.
 - seed bug, notes, (44) 851.
 - seed oil, digestibility, (47) U.S.D.A. 560.
 - selection, basis for, (42) 141.
 - shot-hole borer, studies, (41) 359, 463; (44) 851, 855; (50) 454.
 - soils of India, (41) 718, 816.
 - stem disease, notes, (43) 444, 552.
 - studies, (50) 836.
 - substitutes for, (47) 612.
 - termites affecting, (49) 450, 849.
 - tortrix, studies, (41) 357; (42) 152; (44) 851.
 - variety tests, (45) 140.
 - vegetative propagation, (50) 645.
- Teachers—*see also* Agricultural teachers.
- training for consolidated schools, (50) 195.
- Teak—
- beetle, studies, (42) 56.
 - contraction while seasoning, (42) 44.
 - forests in Burma, management, (42) 241.
 - heart rot, notes, (50) 354.
 - insects affecting, (41) 57; (42) 357; (43) 450.
 - interplant for, (47) 241.
 - production in Java, (48) 739.
 - reproduction, (41) 48.
 - toxic properties, (47) 443.

Teasel, fuller's, culture, (44) 143.

Technical education, cost, (49) 596.

Tectona grandis, studies, (42) 44.

Teeth—

- as affected by diet, (41) 365, 471, 858.
- children's, health of, (44) 666.
- decalcification and regeneration, (48) 465.
- diseases, prevention, (46) 561.
- effect of defective diets, (48) 465.
- effect of vitamin-deficient diets, (45) 466.
- relation to pH of saliva, (47) 367.

Teff grass—

- culture experiments, (48) 629.
- culture, history, and uses, (45) 133.
- hay, analyses, (45) 775.

Telenomus—

- busseolae n.sp., description, (48) 59.
- californicus, notes, (45) U.S.D.A. 154.
- n.spp., description, (43) 857.
- truncativentris, studies, (48) 53.

Teleost, viviparous, sex differentiation in, (50) 331.

Telephone companies, farmers', organization and management, (48) U.S.D.A. 597.

Telephoraceae on oak, (43) 449.

Telescopic control tube, description, (44) 13.

Telphusa mariona n.sp., description, (45) 156.

Tempe drainage ditch, (48) Ariz. 487.

Temperature—*see also* Climate and Soil temperature.

- air and water at western bank of Gulf Stream, (45) U.S.D.A. 17.

- alternating, effect on germination, (49) 221.

- and fat percentage in milk, relation, (49) 73.

- and humidity during 1920, (44) U.S. D.A. 717.

- and rainfall, (45) Miss. 210.

- and rainfall, effect on wheat, (47) 115, 616.

- and rainfall in New South Wales, (47) 720.

- as affected by white pine removal, (48) 344.

- as affected by wind direction, (43) U.S.D.A. 118.

- average, during 1922, (48) U.S.D.A. 715.

- belts and fruit growing in North Carolina, U.S.D.A. (49) 314, 337.

- body, as affected by high altitudes, (43) 565.

- change, apparatus for, (44) 322.

- changes, (45) U.S.D.A. 16.

- changes as affected by vegetative evaporation, (45) 319.

- changes, relation to subterranean water, (49) 789.

- charts of United States, (45) U.S.D.A. 721.

- coefficients of hydration and growth, defining, (41) 27.

- critical, for pear orchards, (50) U.S. D.A. 807.

- distribution charts, (44) U.S.D.A. 121.

- distribution in California, (43) 417; (44) U.S.D.A. 121.

effect on—

- accessory food factors, (42) 463.

- action of chloropicrin, (43) 157.

- basal metabolism of swine, (48) 872.

- bean seedlings, (47) 831.

- bent wing mutation, (50) 823.

- citrus fumigation, (44) U.S.D.A. 250.

- color of hair and feathers, (49) 165.

- coniferous seedlings, (50) 443.

- corn, U.S.D.A. (41) 810; (44) 118.

- fat content of milk, (47) 380.

- fungus flora, (41) 841.

Temperature—Continued.

- effect on—continued.
 - nitrification, (50) 516.
 - nitrogen fixation, (49) 18.
 - ommatidial number in heterozygous fruit fly, (49) 266.
 - plant diseases, (50) 41.
 - plant growth, (50) 821.
 - planting and harvest dates, (41) U.S.D.A. 716.
 - potato culture, (47) Iowa 229.
 - resistance to wounding of small fruits, (43) U.S.D.A. 39.
 - testing cotton materials, (50) 234.
 - trichinae, (44) U.S.D.A. 80.
 - Ustilago zeae, (49) 749.
 - wheat scab, (47) Wis. 445.
 - winter wheat, (41) U.S.D.A. 810.
- experiments in incubation, (47) Ind. 176.
- fluctuation in soils, (43) Md. 121.
- for dairy barns, (44) 688.
- freezing, for fruits and vegetables, (48) U.S.D.A. 730.
- ground v. air, (44) U.S.D.A. 715.
- high, endurance by Helianthus embryos, (50) 325.
- high, sensitivity of mitochondria to, (50) 325.
- in a desert, (47) U.S.D.A. 415.
- in Canada, (44) 810.
- in cold waves, rapid fall, (45) U.S.D.A. 17.
- in laboratories, automatic control, (45) U.S.D.A. 291.
- in New York subways, (42) U.S.D.A. 620.
- injurious to plants, (43) U.S.D.A. 237.
- inversion in North Carolina mountains, (42) U.S.D.A. 619.
- inversions, nocturnal, (45) U.S.D.A. 320.
- low, automatic control, (50) 589.
- low, damage to fruit, (43) U.S.D.A. 16.
- low, effect on blood sugar and ovulation, (50) 868.
- low, effect on composition of coffee leaves, (48) 222.
- low, effect on gipsy moth eggs, (48) U.S.D.A. 54.
- low, effect on plants, Minn. (47) 348; (50) 125.
- mean annual, in South Africa, (42) 212.
- mean daily, discrepancies in computing, (42) N.Y.State 316.
- means and growing season in relation to frost dates, (41) U.S.D.A. 118.
- measurement, (43) U.S.D.A. 718.
- minima at 5 cm. above the earth, (47) 615.
- minimum for cranberry bogs, forecasting, (48) U.S.D.A. 509.
- minimum, new method of computing, (43) Mass. 119.

Temperature—Continued.

- minimum of Paraguay in 1918, (43) 418.
- minimum, predicting, U.S.D.A. (42) 619, 620; (43) 15; (48) 113.
- minimum surface-soil, forecasting, (44) 716.
- night, as affected by soil conditions, (48) U.S.D.A. 113.
- night, in orange groves, (42) 537.
- normal, determination, (42) 805; (44) U.S.D.A. 120.
- norms of Brazil, (49) 615.
- observations, effect of exposure on, (44) U.S.D.A. 717.
- observations, relation to codling moth control, (49) U.S.D.A. 509.
- of adult fowls, studies, (49) N.C. 787.
- of fermentation, effect on silage, (49) 264.
- of leaves, determination, (41) 222; (42) 628; (44) 131; (50) 425.
- of Mexico, (50) U.S.D.A. 116.
- of plant tissue, effect of parasitic fungi, (48) 432.
- of springs, (43) 321.
- of surface soil, daily changes, (43) 321.
- of United States, (47) U.S.D.A. 16.
- of water, effect on fish development, (48) 367.
- on pavements, effect, (50) 790.
- optimum, for rice seed beds, (49) 632.
- orchard, effect of cover crops, (48) 113, U.S.D.A. 508.
- orchard, new methods of predicting, (43) U.S.D.A. 16.
- prediction, long-time, (44) 207.
- reduction to sea level, (41) 808.
- regulator for incubators, (43) 822.
- relation to—
 - alfalfa seed production, (41) U.S.D.A. 732.
 - codling moth, (47) 852.
 - cotton, (50) 415.
 - plant growth, (41) 725.
 - seasonal progress of vegetation, (41) 819.
 - seed production in Scotch pine forests, (49) 744.
 - sun spots, (49) U.S.D.A. 718.
 - wheat yield, (42) 617.
- rôle in development of mosaic, (47) 348.
- stresses in rigid pavements, (44) 285.
- summer, forecasting in Japan, (45) 113.
- survey of Salt River Valley, (45) U.S.D.A. 721.
- Texas parade-ground, (42) U.S.D.A. 620.
- toleration by Drosophila, (50) 729.
- types, composite, of United States, (46) 314.
- urban v. suburban, (41) U.S.D.A. 120.

- Temperature—Continued.
 variations in Atlantic Ocean, (43) 810.
 variations in South Temperate Zone, (43) 418.
 variations in United States, (45) U.S.D.A. 15.
 water-surface, of Gulf of Mexico, effect on Texas weather, (50) U.S.D.A. 115.
 waves, penetration into soil, (41) 422.
 winter, periodicity in Europe, (44) 618.
- Tenai, *Piricularia* on, (46) 448.
- Tendredo compressus, notes, (44) 167.
- Tenebrio molitor, parasite of, (49) 157.
- Tenebrionidae, ecology, (44) 855.
- Tenebroides corticalis, enemy of codling moth, (45) 856.
- Tennessee—
 Station, notes, (41) 100, 900; (43) 900; (44) 397; (45) 500; (46) 797; (49) 498, 900.
 University commencement, editorial, (45) 7.
 University, notes, (41) 100, 399, 500, 900; (43) 300, 900; (44) 98, 397, 700; (45) 500; (46) 299; (47) 800; (49) 498, 900; (50) 196.
- Tent caterpillar—
 control, (41) 662; (43) Oreg. 756.
 destruction by birds, (43) 250.
 forest, outbreaks, (50) 844.
 in South Dakota, (46) 750.
 notes, (41) Conn.State 159; (46) 51.
 papers on, (44) 653.
- Tenthredinidae, new species, (43) 857.
- Tenuipalpus—
 bioculatus, notes, (43) 555.
 lineola, notes, (50) Conn.State 50.
- Teosinte—
 and corn hybrids, studies, (41) 437; (43) 529.
 characteristics and uses, (48) 435.
 in Mexico, (47) 232.
- Tepary bean hay, analyses. (41) Ariz. 367.
- Tepary beans—
 as dry farm crop, (41) Ariz. 29.
 as food substitute, (46) 755.
 breeding experiments, (41) Ariz. 332.
 culture, (43) Ariz. 733.
 resistance to alkali, (43) Ariz. 724.
 white, climatic adaptations, (42) 33.
 yields, (41) Ariz. 332.
- Tephrosia candida, effect of length of day, (50) P.R. 533.
- Teracotona submacula, notes, (48) 54.
- Teredo navalis, summary, (47) N.J. 251.
- Termes lucifugus, habits and control, (46) 656.
- Terminalia paniculata, distribution and characters, (50) 40.
- Termites—
 affecting lumber, (48) V.I. 354.
 affecting tea, (49) 450, 849.
 and termitophiles, (43) 450.
 bionomics of, (46) 656.
- Termites—Continued.
 colonizing reproductive adults, (43) 556.
 control, (47) N.H. 552; (48) Fla. 251.
 destruction by chloropicrin, (46) 656.
 Formosan, remedies, (42) 851; (45) 552.
 in buildings, (42) Mich. 694; (46) N.H. 350.
 in Canal Zone, studies, (50) 659.
 in Hawaii, (44) 853.
 in northern Australia, (45) 853.
 in Porto Rico, (46) 558.
 in savage Sudan, (49) 847.
 in South Africa, key, (46) 245.
 in United States, (41) U.S.D.A. 355; (42) 851.
 intestinal protozoa in, (50) 256.
 Nearctic, revision, (43) 256.
 Nearctic, structural modifications, (41) 64.
 new, from Arizona, (42) 648.
 new genus from Fiji, (45) 254.
 parasites of, (41) 464; (45) 658.
 preservation of wood against, (45) 657; (47) 360.
 protecting buildings against, (43) 592.
 South Indian, (47) 358.
- Termopsis, notes, (43) 256.
- Terobia flora, notes, (45) 459.
- Terrace, Mangum, construction, Mo. (44) 620; (48) 717.
- Terracing—
 in Oklahoma, (42) 278.
 in Texas, table for, (42) 888.
 to prevent soil erosion, (43) 481.
- Terrapin scale—
 notes, (47) Conn.State 156.
 on peach trees, control, (45) 344.
 studies, (45) 552.
- Testacellidae, phylogeny of, (42) 451.
- Testes—
 degeneration, effects, (45) 771.
 degeneration in dogs, (43) 269.
 degeneration on deficient diet, (42) 468.
 development as affected by inanition, (46) 265.
 form of seminiferous tubule, (42) 559.
 internal secretion, (44) 468.
 of intersexual animals, histological study, (50) 227.
 of rats, degeneration on milk diet, (50) 867.
 transplantation and law of functional constancy, (44) 865.
- Testicles, function, effect of sight on, (49) 164.
- Testicles of pigeons as affected by diet deficiency, (43) 369.
- Tetanoceridae, Nearctic, synoptic keys, (45) 257.
- Tetanops aldrichi, notes, (48) 752.

Tetanus—

- antitoxin, curative value in horses, (46) 279.
 axtitoxin, standardization, methods, (42) 676.
 bacilli as affected by pH, (46) 683.
 bacillus, reaction produced by, (47) 682.
 fractioned antitoxic serums, (42) 475.
 in horses, treatment, (42) 383.
 popular account, (49) 379.
 prophylaxis and treatment, (41) 576.
 resembling disease among cattle, (50) 788.
 rôle of calcium ions in, (41) 83.
 serum prophylaxis and therapy, (46) 481.
 spores, disinfectants for, (44) 779.
 studies, (41) 876; (45) 680.
 toxin, paths of spread, (46) 181.
 Tetany and rickets, comparison, (47) 567.
 Tetany, cure by sunlight, (47) 566.
 Tethelin feeding of white mice, effects, (41) 766, 767, 768.
 Tetrabromphenol sulphophthalein, use in titration, (42) 504.
 Tetracoccus liquefaciens as cheese starter, (43) 681.
 Tetradymia glabrata—
 poisonous to livestock, (43) Nev. 273.
 poisonous to sheep, (46) 396.
 Tetrahydro- naphthylamin, effect on catalase production, (42) 259.
 Tetraleurodes herberti n.sp., description, (47) 657.
 Tetralonia, pollination by, (47) 857.
 Tetralopha robustella, notes, (41) Conn. State 159.
 Tetranychidae, new Nearctic, (46) 161.
 Tetranychus—
 bimaculatus, notes, (42) Ariz. 357; (43) U.S.D.A. 352.
 mytilaspidis, notes, (47) 558.
 pacificus n.sp., description, (42) 551.
 populi, notes, (50) Conn.State 50.
 sp., notes, (48) 153.
 sp. on sugar cane, (42) 52.
 spp., control, (46) 160.
 spp., notes, (43) 555.
 telarius, control, (48) Calif. 460; (49) V.I. 352.
 telarius, notes, (41) 760; (42) 748; (45) 560; (47) Calif. 653, Idaho 763, N.Y.Cornell 848.
 yothersi, notes, (43) 255, 851; (47) U.S.D.A. 157, U.S.D.A. 359.
 Tetraphosphate as fertilizer, (46) 718.
 Tetraphosphate, manufacture, (41) 628.
 Tetrastichodes detrimentosus, parasitism by, (44) Va. 756.
 Tetrastichus—
 asparagi, notes, (41) 59.
 diarthronomyiae, notes, (49) 56.
 giffardianus, studies, (42) 654; (50) 55.
 rapo, notes, (48) 158.

Tetrastichus—Continued.

- rugglesi n.sp., description, (41) 463.
 sp., notes, (44) U.S.D.A. 163.
 sp. parasite of chrysanthemum midge, (43) U.S.D.A. 361.
 spp., notes, (43) U.S.D.A. 365.
 thripophonus, new parasite of thrips, (50) 159.
 xanthomelaenae, notes, (47) 261.
 Tetropium gabrieli, summary, (50) 848.
 Tettigoniatriafasciata, new genus for, (41) 253.
 Teuchothrips, new genus, erection, (41) 551.
 Texas blue grass, adaptation and behavior, (48) Calif. 527.
 Texas College, notes, (41) 399, 500; (43) 200; (47) 100; (48) 397, 797; (50) 699.
 Texas fever—see also Piroplasmosis, bovine.
 eradication in Porto Rico, (42) 779.
 immunes, hypertrophy of hemolymph nodes in, (49) 681.
 in cattle, (49) Wash.Col. 278.
 in Queensland, (43) 182.
 parasite, studies, (45) 685.
 tick, see Cattle tick.
 Texas Station—
 notes, (44) 98, 398; (45) 500; (48) 397; (49) 99, 498; (50) 699.
 publications available, (44) 297.
 report, (41) 299; (45) 298; (46) 394; (49) 495.
 Substation No. 11, report, (43) 98.
 Textile—see also Fabrics.
 chemistry, progress, (41) 613, 801.
 chemistry, treatise, (50) 308.
 fabrics, treatise, (50) 695.
 fibers, determination of flexibility, (46) 230.
 industry, animal fibers in, (46) 770.
 industry, dictionary of terms, (49) 528.
 industry, hair used in, identification, (44) 467.
 materials, substitutes in Germany, (43) 204.
 problems, newer ways with, (50) 829.
 raw materials, treatise, (47) 208.
 Textiles—
 and clothing, graduate work in, (50) 297.
 and clothing, teaching methods, (50) 796.
 course of study, (44) 393.
 mildew resistance, tests, (42) 508.
 production in East Africa, (44) 594.
 teaching in high schools, (45) 697.
 textbooks, (41) 698, 897.
 Thalassiophyta and subaerial transmigration, (46) 524.
 Thalictrum dasycarpum, dioeciousness in, (42) 820.
 Thamnidium elegans on cold storage meat, (47) 560; (48) 258.
 Thanet weed, eradication, (49) 831.

- Thaumatotypidea, new species, (45) 663.
 Thecodiplosis mosellana, *see* Wheat midge.
 Theileria—
 hirci n.sp., description, (50) 882.
 mutans of Mediterranean Basin, (49) 400.
 spp., notes, (43) 883.
 Theileriasis in goats and sheep, (50) 882.
 Thelephora spp. on coniferous seedlings, (48) 249.
 Thelephoraceae of North America, studies, (42) 147.
 Thelohania opacita n.sp., description, (48) 156.
 Thelohania spp., notes, (47) 256.
 Themedra forskalii mollissima for paper making, (42) 531.
 Theobroma spp.—
 deformation of inflorescence, (43) 349.
 seeds, oil from, analyses, (47) 803.
 Theobromin—
 and caffein, distinguishing between, (41) 714.
 determination in cacao beans, (47) 807.
 determination in cocoa, (45) 413; (47) 807.
 Theretra alecto, life history notes, (48) 554.
 Thereva nobilitata on rye, (41) 661.
 Therevidae, North American, revision, (50) 848.
 Theridion tepidariorum, life history, (46) 161.
 Therina somnaria, notes, (42) U.S.D.A. 854.
 Therion morio, notes, (49) 555.
 Thermal belts in North Carolina mountains, (42) U.S.D.A. 619.
 Thermobacterium helveticum as cheese starter, (43) 681.
 Thermobacterium, new genus, erection, (43) 680.
 Thermocouple, needle type, improvements, (44) 10.
 Thermometers, house, (44) U.S.D.A. 717.
 Thermometrical tables, (41) 808.
 Thermoregulator, description, (42) 411; (48) 526.
 Thermos flask, laboratory uses, (46) 614.
 Thermotropism in plants, (45) 731.
 Thielavia basicola—
 control, (41) U.S.D.A. 39.
 notes, (41) 154, 248; (42) N.Y. Cor. nell 147; (43) 246, Mass. 845; (44) Ohio 155; (45) Can. 848; (46) Ky. 848; (47) Ga. 444, Pa. 445, Ky. 449, 545; (48) Fla. 646; (49) Ga. 537, Ky. 544, Fla. 838, 843; (50) 248.
 Thielavia sp., notes, (45) 843.
 Thielaviopsis—
 ethaceticus, notes, (42) 741.
 paradoxa, notes, (46) 45, 46, 647; (47) 547.
 paradoxa on pineapple, (43) 152.
 paradoxa on sugar cane, (43) La. 348.
 Thingan timber, properties and uses, (49) 43.
 Thiobacillus thiooxidans—
 n.sp., characteristics, (47) 621.
 notes, (46) 822.
 oxidation of sulphur by, (47) 27.
 solid medium for cultivation, (48) 816.
 use as sulphur-oxidizing agent, (49) 818.
 Thiobacteriales, subgroups and genera, (41) 821.
 Thiocarbonate, determination, (42) 206.
 Thiocyanates, determination, (42) 414.
 Thiosulphate, determination, (42) 10.
 Thiosulphate, use, effect of pH value, (49) 26.
 Thirst, effect on weight and growth, (46) 264.
 Thistle, Fuller's, culture, (44) 143.
 Thistles—
 control, (41) 229, 537; (46) 727; (47) 824.
 differentiation and control, (43) N.J. 141.
 eradication, (44) Minn. 732.
 Russian—
 as forage crop, (43) 527; (44) N.Dak. 31.
 as hay crop, (48) N.Dak. 226.
 control, (44) 439.
 culture experiments, (45) Kans. 33.
 hay analyses, (45) N.Dak. 266.
 notes, (46) 536.
 silage from, (41) N.Mex. 176.
 v. alfalfa hay for cows, (42) Kans. 264.
 Thitsi. oleo-resin from, (41) 345.
 Thlaspi alliaceum, notes, (50) 439.
 Thomas ammonium calcium phosphate, storage experiments, (46) 820.
 Thomas meal, fertilizing value, (44) 319; (45) 623.
 Thomas phosphate meal, analyses, (48) 205.
 Thomas slag, *see* Phosphatic slag.
 Thompson Institute for Plant Research—
 editorial, (45) 404.
 establishment, (44) 900.
 Thorium X, effect on antibody formation, (42) 879.
 Thorn leaf aphid, notes, (41) 850.
 Thorne, C., biographical sketch, (45) 304.
 Thresher—
 cylinder, mechanics of, (49) 86.
 explosions, causes and remedies, (45) 892.
 small grain, description, (47) 391.
 Thresher-reaper, combined, use in Canada, (50) Can. 288.
 Threshers, wooden and all-steel, experiments, (50) 88.
 Threshing—
 by electricity and coal, (48) 685.
 drums, balancing, (49) 485.
 machines, dust-collecting fans for, (43) U.S.D.A. 390.

Threshing—Continued.

- machines, operation, (42) 282.
- methods, (42) 95.
- power from tractors, (42) 587.
- ring in Corn Belt, (41) U.S.D.A. 694.
- stone roller for, (42) 893.
- tractor costs, (41) 790.

Thrips—

- arizonensis, notes, (42) Ariz. 357.
- cerealium, notes, (47) 551.
- from Trinidad, parasite of, (50) 159.
- greenhouse, on avocado, (43) 53, 851.
- in citrus bloom, control, (48) Fla. 251.
- in Costa Rica, (46) 647.
- on citrus, control, (47) 850; (50) 555.
- red-banded, on mangoes, (47) U.S.D.A. 359.
- tabaci, *see* Onion thrips.

Thrushes, missel and song, economic position, (41) 454.

- Thuja plicata, fungus affecting, (45) 548.
- Thuja seedlings, fungus attacking, (43) 49.

Thumbergia erecta caerulea, notes, (44) 442.

Thumbs, hereditary shortness, (50) 227.

"Thumps," relation to Ascaris, (41) 285.

Thunderstorms, distribution in United States, (43) U.S.D.A. 119.

Thurberia boll weevil problem in Arizona, (47) 53.

Thurberiphaga catalina, notes, (50) 660.

Thyme—

- culture and preparation of products, (50) 140.
- Spanish, as food substitute, (46) 755.
- wild, as adulterant for marjoram, (42) 415.

Thymectomized animals, prolongation of survival period in, (50) 772.

Thymol—

- action on intestinal parasites of horse, (46) 885.
- anthelmintic value, (50) 380.
- effect on hookworms, (45) 287.
- efficiency against hookworms in silver black fox, (46) 184.
- germicidal value, (44) 680.
- sources of, (41) 825.
- synthesis from p-cymene, (44) 10.
- taenicidal value, (46) 687.
- vermicidal value, (45) 484.

Thymolphthalein, use as indicator, (43) 10.

Thymolsulphophthalein, use as indicator, (42) 504, 611.

Thymus, in birds, involution of, (42) 165.

Thymus, injections in young rabbits, (44) 266.

Thyridaria tarda, notes, (47) 754.

Thyroid—

- and parathyroid removal effects, (50) 774.
- and parathyroids, relation, (44) 670.

Thyroid—Continued.

and pituitary gland, correlation, (43) 770.

- changes due to inanition, (45) 667.
- changes in deficiency disease, (43) 664.
- effect on adrenal glands, (44) 669.
- effect on catalase production, (42) 258.
- extract, effect on metabolism of guinea pigs, (45) 766.

feeding, effect on—

- creatinuria, (46) 65.
- growth, (47) 373, 374.
- male fowl, (48) 166.
- organs, (44) 670.
- pancreas, (44) 669.
- pituitrin content, (44) 669.

gland diseases, diagnosing by indirect calorimetry, (45) 66.

gland extract, effect on polyneuritic pigeons and tadpoles, (43) 865.

glands—

- effect of ill-balanced foods, (44) 667.
- effect on carbohydrate metabolism, (42) 557.
- effect on growth, (48) 870.
- iodin distribution between cells and colloid in, (45) 266.
- of bulldog calves, (48) 85.
- tryptophan content, (45) 312.

hyperplasia, (47) 278.

iodin compound of, isolation, (41) 409.

material, effect on plant growth, (43) 225.

preparations, iodine in, determination, (42) 614.

rickets-producing effect, (49) 65.

secretion, chemistry of, (47) 482.

Thyroidectomized animals, calcium in blood of, (49) 765.

Thyroidectomy—

effect on fetus and duration of gestations, (44) 669.

effect on lambs' wool, (46) 72.

Thyroparathyroidectomy in rabbits, (50) 868.

Thyroxin, identification, (42) 203.

Thysanoses, North American, key, (46) Miss. 461.

Thysanoptera—

Indian, notes, (45) 657.

new, descriptions, (42) 648.

new, from Florida, (45) 659.

new genera and species from Australia, (42) 154.

new genus and species from southern India, (42) 154.

of Australia, (41) 551.

of British Columbia, (41) 755.

of Florida, (41) 847.

of North America, synopsis and catalogue, (50) Fla. 660.

Swedish, notes, (42) 154.

Thysanosoma actinioides, life cycle, (45) Wyo. 478.

Tick fever in Palestine, (42) 570.

Tick infested area, cost of cattle industry in, (42) 179, 883.
 Tick paralysis, (45) 883; (46) 775; (50) 762.
 Tick trefoil, creeping, notes, (48) Guam 228.
 Tick worry in Queensland, (43) 182.
 Tickle grass, injury to sheep, (41) Nev. 782.
 Ticks—*see also* Cattle tick.
 as carriers of equine piroplasmosis, (42) 382.
 classification and life histories, (44) 858.
 control, (44) 858.
 control in Montana, (46) 59.
 control in Trinidad, (46) 82.
 duration of infectivity, (42) 677.
 eradication, (41) 286, 777; (45) 177, 381, 680; (48) P.R. 251, U.S.D.A. 379.
 eradication laws, (41) Ark. 479.
 human, transmitting agent of relapsing fever, (46) 682.
 in New Zealand, (47) 486.
 in Punjab, (49) 157.
 infesting livestock in Rhodesia, (46) 465.
 migration and reaction to light, (43) 164.
 of Nyasaland, notes, (42) 160.
 of Panama, hosts in relation to disease transmission, (49) 157.
 prevention on oxen, (42) 76.
 relation to fistulous withers, (41) 480.
 relation to piroplasmosis, (43) 83.
 spotted fever, control, (41) 57; (46) 59, 555.
 transmission of Rocky Mountain spotted fever by, (49) 256.
 transmission of surra by, (46) 881; (48) 482; (49) 157.
 Tide stages, forecasting, (42) U.S.D.A. 620.
 Tides, rôle in rice irrigation, (43) 689.
 Tikitiki extract, preparation, (46) 569.
 Til, natural crosses, (44) 429.
 Tile trenching machinery, (44) U.S.D.A. 86.
 Tile walls, load tests, (47) 793.
 Tiles, roofing, home manufacture, (49) 790.
 Tili cake, fertilizing value, (41) 816.
Tilia americana—
 foliar transpiring power, (43) 223; (48) 624.
 seed germination, (42) 432.
 Tillage—
 deep, value, (47) Wis. 417.
 experiments, (48) N.Dak. 226; (49) Nebr. 732.
 history and philosophy of, (42) 132.
 implements, homemade, construction, (47) 293.
 implements, mechanics, (47) 891.

Tillage—Continued.
 machinery, care and operation, (42) 893.
 machinery, notes, (43) 892.
 machinery, tests, (50) 687.
 studies, (49) Oreg. 526.
 summer, (47) Mont. 432.
 summer fallow, value, (47) Wash. 212.
 Tilletia—
 caries, notes, (44) 343.
 faetens, notes, (44) Conn.State. 150.
 horrida, notes, (41) 841; (45) 650.
 laevis, notes, (44) 540.
 levis, germination, relation to H-ion concentration, (46) Mo. 344.
 sp. on wheat, (43) 347.
 spp., studies, (43) 445; (47) Oreg. 148, 245.
 texana in Missouri, (47) 750.
 tritici—
 control, (49) 841.
 effect on wheat, (45) 144.
 notes, (42) 47; (46) 239; (47) 542.
 relation to spore load, (48) 243.
 studies, (48) 741.
 Tilletiaceae, distribution in Baltic regions, (46) 239.
 Tillini, synopsis, (47) 658.
 Timber—*see also* Lumber and Wood.
 airplane, effect of incipient decay on mechanical properties, (47) 251.
 artificial seasoning, (44) 686.
 black walnut, (44) U.S.D.A. 537.
 census of New York, results, (43) 748.
 cutting in Appalachians in relation to changed conditions, (41) 838.
 decay, cause and prevention, (46) 382.
 decay, fungi in, (47) U.S.D.A. 451.
 decay in buildings, (41) 453.
 depletion, remedies, (43) U.S.D.A. 649.
 Douglas fir, durability tests, (42) 387.
 Douglas fir, measurement, (44) 537.
 dry rot, notes, (43) 350.
 drying, (50) 485.
 estimating, instructions, (49) 837.
 estimation, (41) 47, Vt. 47, 540, 840.
 estimation, volume tables, (43) 443; (44) Calif. 742.
 exploitation in French colonies, (42) 446.
 felling machinery in Germany, (42) 278.
 green, poisoning, (50) Mich. 445.
 growth, collection of data, (43) 748.
 Hollong, notes, (42) 840.
 infected, slash disposal, (42) 445.
 injury from lepidopterous larvae, (46) 750.
 insect injury, prevention, (48) U.S.D.A. 52.

Timber—Continued.

- insects affecting, (49) 84.
 - limitation of cut, determining, (44) 147.
 - line in Luleå-Lappmark, studies, (42) 142.
 - line, relation to climatic factors, (43) 840.
 - marking rules, pathological, (41) 840.
 - measurement, "absolute form quotient," (43) 149.
 - measurement in Upper Burma, atha system, (42) 840.
 - measurement, volume tables, (44) 538.
 - mine or crop, (49) U.S.D.A. 341.
 - plantations, establishment in Africa, (46) 42.
 - "pooli," mechanical properties, (43) 483.
 - removal by poisoning with sodium arsenite, (42) 184.
 - research, (47) 389.
 - residue, effect on bacteriological activity in soil, (47) 813.
 - resistance to termites, (42) 851.
 - resources of the United States, (42) 281.
 - rot, control, (44) 751.
 - seasoned, beetles damaging, (48) 555.
 - softwood, supplies of United States, (50) 837.
 - soils, management, (47) Minn. 121.
 - standing, binocular attachment for observations on, (49) 50.
 - strength obliquely to the grain, formula, (49) 687.
 - strength of bolts in, (45) 892.
 - structural, effect of zinc chlorid, (47) 289.
 - structural, grading rules and working stresses, (50) U.S.D.A. 187.
 - supplies, (42) Ohio 347.
 - supply in Italy after the war, (44) 240.
 - supply of United States, (48) 640.
 - surveys, instructions, (42) 642.
 - trade of Switzerland, (44) 240.
 - treatise, (47) 442.
 - tree diseases, (46) 454.
 - tree diseases of Ontario, survey, (45) 239.
 - trees, cultivated, for South Africa, (45) 141.
 - trees, insects affecting, (47) 443.
 - trees, Nigerian, (43) 840.
 - trees of Sao Paulo, Brazil, (46) 236.
 - volume tables, alinement chart method, (46) 739.
 - warped and seasoned, tests, (43) 789.
 - western species for railroad ties, (50) 142.
- Timberland insurance, factors affecting, (43) 149.
- Timberlands, American, valuation, treatise, (46) 444.

Timbers—

- and their uses, handbook, (42) 446.
 - antiseptic treatment, (42) 44.
 - Australian, crystals in, (41) 745.
 - Australian, strength, (47) 443.
 - British Columbia, uses, (44) 148.
 - British Guiana, descriptive list, (42) 240.
 - coniferous, bluing in, (49) 447.
 - creosoting, (41) 584, 585.
 - farm, creosote treatment, (48) Mo. 680, 783, Mo. 885.
 - farm, measuring and marketing, (46) U.S.D.A. 237.
 - farm, preservative treatment, (42) S.C. 85; (43) 283; (44) 198; (46) 86; (47) Iowa 790; (49) Mont. 184.
 - identification, manual, (44) 47.
 - Indian, air-seasoning, (49) 84.
 - Indian, manual, (47) 539.
 - Indian, notes, (44) 743; (45) 351.
 - Indian, trade names, (46) 843.
 - Madras, nature and uses, (44) 149.
 - Mysore, mechanical tests, (49) 687.
 - of Nigeria, identification, guide, (49) 42.
 - of Western Australia, (44) 47.
 - of world, handbook, (44) 239.
 - Philippine, tests, (46) 283.
 - preservative treatment, cost, (47) 390.
 - sterilization with electrical current, (42) 580.
 - useful, of tropical America, (50) 647.
- Timothy—
- analyses, (41) Wyo. 333.
 - and alfalfa, culture, (44) Wis. 227.
 - and alfalfa hay, yields, (47) Wis. 431.
 - and clover, fertilizer experiments, (42) Minn. 826.
 - and clover for newly broken land, (41) Idaho 226.
 - and clover hay, rotation experiments, (50) R.I. 520.
 - and clover meadow, fertilizer experiments, (47) Minn. 320.
 - and clover yields, (44) 434.
 - as cover crop for tobacco, (46) Conn. State 332.
 - as hay crop, (48) N.Dak. 226.
 - breeding experiments, (41) 830; (48) Can. 31; (50) Can. 433.
 - breeding, recording data, (47) 38.
 - competition in mixtures as affected by fertilizers, (41) 322.
 - culture, (44) Alaska 523.
 - culture experiments, (44) N.Dak. 524; (48) Can. 450; (49) Mont. 430, 735.
 - culture experiments on drained bog soil, (42) 29.
 - culture in British Columbia, (42) 733.
 - dried, water-soluble vitamin content, (42) 759.
 - duration in meadows, (50) N.Y.Cornell 231.
 - effect on following crop, (44) R.I. 33.

Timothy—Continued.

- effect on soil nitrate, (41) Mo. 623; (43) 215.
- effects of self-fertilization in, (49) 134.
- exudate water from, solids in, (49) N.Y.Cornell 520.
- female sterility in, (45) 524.
- fertilizer experiments, (42) Ohio 636, Minn. 826; (45) 736.
- germination as affected by—
 - blue blotting paper, (46) 732.
 - fertilizers, (44) Va. 721.
 - resting period, (42) Wis. 338.
- growth in alkali soil, early, (42) Utah 28.
- hay, cost of production, (42) Mo. 188.
- hay, effect on calcium and phosphorus equilibrium in cows, (48) 477.
- hay, feeding value, (49) Mont. 172.
- hay, fertilizer experiments, (50) Can. 817.
- hay, methods of handling, (49) Colo. 86.
- hay, presence of weeds in, (44) 228.
- hay, yields, (50) Can. 432.
- immature, vitamin content, (41) 762.
- improvement work, (49) N.H. 328.
- in rotations, fertilizer experiments, (41) N.Y.Cornell 21.
- leaf spot, (43) 752.
- life history, (49) 528.
- mountain, analyses, (41) Wyo. 333.
- plowing tests, (44) N.Dak. 509.
- protein content, factors affecting, (44) 229.
- rate of manuring tests, (50) Minn. 121.
- rooting stems in, (45) 234.
- rotation experiments, (41) Del. 136, N.Dak. 139, 823; (44) N.Dak. 524; (47) Minn. 121.
- rust resistance in, (42) 247; (50) Minn. 143.
- seed, hulled and unhulled, (48) Can. 31.
- seed, hulled v. hullless, germination, (42) 236.
- seed, longevity of, (43) 832.
- seed production, (45) 740.
- seed production, effect of isolation, (48) 134.
- seed production trials, (49) Can. 734.
- seed, testing, (41) Iowa 40.
- seeding experiments, (49) Can. 734, Idaho 736.
- selection experiments, (47) Pa. 429.
- self-sterility in, (47) Minn. 331.
- toxic limit of alkali for, (49) 513.
- v. clover, rotation experiment, (50) N.Y.State 421.
- variety tests, (42) Minn. 824.
- vitamin A in, (43) 165.
- wheat-head army worm affecting, (43) 55.
- yields, (41) N.J. 35; (42) Minn. 826.
- yields on irrigated wild meadows, (43) Oreg. 22.

Tin compounds, effect on wheat, (46) 716.

Tin determination, (41) 711.

Tin plate—

- by-products, analyses, (41) Ind. 564.
- by-products, report on, (41) 564.
- use of hydrogenated oils in manufacture, (42) 508.

Tinea cloacella bred from fungi, (42) 157.

Tinea pellionella, *see* Clothes moth.

Tineola biselliella—

- biology, (45) 656.
- control, (50) U.S.D.A. 53.
- effect of red cedar, (47) U.S.D.A. 162.
- notes, (41) 661, 757.

Tipburn, artificial production, (47) 54.

Tiphia—

- key to species, (42) 550.
- parallela, establishment in Mauritius, (42) 551.
- parallela, parasitism by, (45) 853.
- spp., life history, (42) 550.
- spp., parasites of white grubs, (42) 549.

Tipula oleracea, notes, (50) 255.

Tipula spp. on ranges, (45) U.S.D.A. 256.

Tipulidae, studies, (42) N.Y.Cornell 157.

Tipuloidea in District of Columbia, (44) 854.

Tirathaba n.sp., larval and pupal structure, (41) 354.

Tires, pneumatic and solid, specifications, (49) 185.

Tissue, glandular adipose, relation to vitamins, (44) 465.

Tissues, catalytic power, (41) 172.

Titanium—

- in kaolin and clay, (49) 414.
- in plants, (46) Colo. 28.
- in soils, determination, (44) 210.

Titration—

- apparatus for preventing overtitation, (44) 10.
- curves, colorimetric determination, (43) 11.

curves, electrometric, for acids and bases, (48) 710.

electrometric—

application of benzoquinhydrone electrode, (50) 507.

for determination of reducing sugars, (49) 203.

in acidimetry and alkalimetry, (47) 712.

studies, (43) 803.

substitute for hydrogen electrode, (48) 709.

in ethyl alcohol as solvent, (47) 204.

methods, (46) Mich. 413.

of acids and bases, antimony electrode for, (49) 803.

of acids and bases, two indicators for, (46) 413.

of amino and carboxyl groups, (50) 802.

studies, (48) 313.

Toadflax, bastard, parasitism of, (50) 749.
 Toads in West Indies, (44) 57.
 Tobacco—
 aboriginal species, (50) 236.
 and copper sulphate, preparation, (47) Okla. 85.
 angular leaf spot in Rhodesia, (48) 146.
 angular leaf spot, notes, (46) Ky. 848; (47) 544; (48) Va. 246; (49) 545.
 aphid, control in Deli, (41) 354.
 as affected by borax, (44) 516.
 as affected by sodium nitrate, (45) 343.
 as affected by soil electrification, (43) Ky. 824.
 as snuff substitute, detection, (42) N.Dak. 315.
 auction system and cooperation, (49) 231.
 bacterial disease, (44) 449.
 bacterial leaf spot, (49) 248.
 bacterial leaf spot, effect of temperature, (50) 41.
 bacterial wilt, (42) 844.
 barium in, (46) Colo. 28.
 barns, flue-heated, for sweet potato storage, U.S.D.A. (47) 635, 688.
 biochemistry of, (44) 201.
 black shank, notes, (49) Fla. 838.
 blackfire, control, (47) Va. 843.
 blackfire, description and control, (49) 647.
 blue-mold disease, (45) U.S.D.A. 355.
 branching habit, (41) 830.
 breeding experiments, (44) 633; (45) 734.
 breeding for root rot resistance, (47) Ky. 448.
 brown root rot, studies, (45) Wis. 243.
 bugs, notes, (44) 653.
 burning quality, relation to grain, (43) Pa. 534.
 chlorosis, varietal, inheritance, (41) 440.
 cigar, industry in Pennsylvania, (50) 237.
 climatic requirements, (41) U.S.D.A. 417.
 color and quality as affected by time of harvesting, (49) Conn.State 634.
 Connecticut Valley, production, (43) Mass. 141.
 cost of production, (45) Ky. 42.
 cultivation of soils for, (48) 817.
 culture, (43) Mass. 830; (44) 530; (46) Wis. 333; (48) Ga.Coastal Plain 129.
 culture—
 and curing, Can. (45) 822; (46) 136.
 and curing in Spain, (46) 136.
 and handling in Dutch East Indies, (48) 231.

Tobacco—Continued.
 culture—continued.
 and preparation, handbook, (49) 36.
 and treatment in Great Britain, (42) 439.
 experiments, (41) 528, Can. 528, 529, N.C. 638, 644; (42) Va. 436; (43) Can. 336, 637, Can. 735; (44) 633, 733; (45) 34, 532; (46) 131, Can. 836; (47) N.C. 527; (48) 434; (50) N.Y. State 437, Can. 537.
 for nicotin, (49) 36.
 history, U.S.D.A. (43) 437; (49) 334.
 in Australia, (48) 630.
 in Burma, (41) 529.
 in Ceylon, (41) 529.
 in Colombia, (46) 391.
 in Cuba, (44) 438.
 in Cyprus, (44) 137.
 in Greece, (45) 536.
 in Ilorin Province, (49) 734.
 in India, (41) 529.
 in Ireland, (41) 440.
 in Porto Rico, (42) 30.
 in Spain, regulations, (43) 35.
 in Tropics, (42) 599.
 in Uganda, (42) 32.
 cured, factors affecting color, (43) 637.
 curing, (43) Ky. 824; (44) 438; (48) 288, 830; (49) Conn.State 633; (50) Can. 537.
 curing, Angeloni system, (49) 36.
 curing barn, description, (49) 899.
 curing barns and packing houses, (42) 489; (46) 588.
 curing barns, construction, (45) 344.
 curing barns, development, (50) 97.
 cutworm, control, (43) Can. 337.
 damage from various causes, (44) U.S.D.A. 118.
 damping-off, notes, (44) 445.
 dark, experiments, (49) Va. 134.
 Deli, hybridization experiments, (44) 141.
 Deli, selection experiments, (41) 644; (42) 237; (43) 831; (45) 740; (48) 231.
 Deli, types, (50) 236.
 disease, new, control, U.S.D.A. (45) 247, 248.
 disease, notes, (43) 445.
 disease resistant strains, (42) Wis. 350.
 disease survey in India, (46) 544.
 diseases, (47) 48; (48) Fla. 646.
 diseases—
 and pests, (46) Can. 836.
 control, (43) Mass. 845.
 in Brazil, (50) 248.
 in Deli, (46) 551.
 in Dutch East Indies, (48) 454.
 in England and Wales, (49) 645.

Tobacco—Continued.

diseases—continued.

- new, studies, (45) 443.
 - notes, (44) Conn.State 150, Wis. 241; (45) Wis. 243.
- dust—
- and lime, insecticidal value, N.H. (46) 350; (49) 351.
 - aphiscidal properties, (49) N.Y. State 552.
 - as contact insecticide, (50) 557.
 - for intestinal roundworms in poultry, (42) Calif. 886.
 - in chick feed, value, (45) Ind. 172.
 - insecticidal value, (48) 851.
- effect of prolonged daylight on growth and flowering, (49) Alaska 426.
- effect of shade and fertilizers, (42) Guam 31.
- effect on arsenical compounds, (49) 751.
- electroculture experiments, (50) 131.
- experiments, (47) Pa. 435.
- experiments in Africa, (46) 227.
- experiments in Pennsylvania, (49) Pa. 737.
- factory wastes, analyses, (45) Can. 815.
- fermentation experiments, (49) Conn. State 634.
- fertilizer experiments, (41) Tex. 35, Md. 143, N.C. 625, N.C. 638, 644, Can. 832; (42) Va. 21, 237, Va. 436; (43) Tex. 33, Ky. 331, Can. 336, N.C. 425, N.C. 434, Pa. 533, Can. 735, Ky. 824, Mass. 830; (44) 438, Ky. 510, 733; (45) 34, Ohio 126, N.C. 430, 740, Can. 822; (46) 131, 638, Can. 836; (47) 322, N.C. 528; (48) Ky. 129, 532; (49) Ky. 524, N.C. 733; 734; (50) 236, 237, Pa. 437.
- fertilizer experiments in India, (42) 517.
- flea-beetle, control, (44) 554; (47) 163.
- flea-beetle in cigar-wrapper district, (50) U.S.D.A. 56.
- flea-beetle, studies, (41) N.C. 554, N.C. 660; (50) V.I. 555.
- flea-beetle, summary, (50) U.S.D.A. 56.
- flower anomalies, (41) 736.
- flue-cured, diseases, (43) 245.
- flue-cured, production in Canada, (41) Can. 831.
- foot rot, notes, (49) Fla. 838.
- fumigation, open air, (49) 758.
- fungus attacking, (44) 150.
- Fusarium root rot, studies, (42) 247.
- Fusarium wilt, studies, (44) 749.
- genetic investigations in, (47) Calif. 635.
- gigantism in, (41) 440.
- grain, defined, (43) Pa. 534.

Tobacco—Continued.

- gummosis, relation to mosaic, (47) 48.
 - gummosis, studies, (50) 347.
 - harvesting experiments, (43) N.C. 434.
 - harvesting methods, Can. (43) 337; (46) 836.
 - Havana, production, (48) 633.
 - Hibshman strain, tests, (46) 837.
 - hornworm, control, (43) Can. 337; (50) U.S.D.A. 53.
 - hybrids, sterility studies, (47) Pa. 445.
 - improved strain for Wisconsin, (41) 736.
 - improvement, (45) 228.
 - indeterminate growth factor in, (47) 533.
- industry—
- in Cuba, (50) 833.
 - in Equador, (48) 35.
 - in Great Britain, progress report, (42) 439.
 - in Porto Rico, (46) 837.
 - statistics, (42) 237.
- inheritance in, (41) 440, 736, 830.
- inheritance of resistance to Thielavia basicola, (47) 545.
- injury by caterpillars, (46) 53.
- insects affecting, (42) Guam 53, 155; (50) 51, V.I. 555.
- insects affecting—
- in Dutch East Indies, (46) 153.
 - in India, (45) 656.
 - in Porto Rico, (49) 53.
 - in Rhodesia, (43) 52.
 - in Sumatra, (45) 853.
- investigations, (44) Pa. 735.
- labor expense of production, (45) 85.
- lanas, control, (48) 454.
- leaf folder on tomatoes, (49) 759.
- leaf, quality in relation to chemical characters, (48) Ky. 129.
- leaf spot, notes, (41) N.C. 638; (42) 448; (43) 246; (44) Va. 746; (49) Fla. 838; (50) 749.
- leaf spot organism, tolerance to acids, (48) 644.
- leaf spot resistant variety, (45) N.C. 430.
- light yellow, tests in Tripoli, (44) 140.
- lime requirements, R.I. (44) 32; (46) 233.
- liming experiments, (45) Ohio 126.
- lithium in, (46) Colo. 28.
- machines for cleaning seed, smoking and drying, (49) Pa. 737.
- manuring experiments, (45) Ohio 126.
- marketing, (43) Mass. 141.
- marketing association, (46) 595.
- mildew, false, from Dutch East Indies, (48) 454.
- mosaic—
- control, (43) 548; (49) 148.
 - infective particles in, (49) 148; (50) 840.

Tobacco—Continued.

mosaic—continued.

- notes, (43) 735; (45) Can. 848; (48) Fla. 646.
- size of infective particles, (47) 752.
- studies, (48) 454; (49) Ky. 545.
- temperature relation, (47) Wis. 446; (50) 41.
- moth in Dutch East Indies, (42) 53.
- new seedling disease, (47) 545.
- nicotin determination in, (49) 807.
- nicotin in, localization, (45) 820.
- Orinoco, culture, (45) Guam 34.
- Orobanche on, (41) 543.
- perique, culture and uses, (46) 837.
- Peronospora disease, (46) 651; (48) Fla. 247.
- pests, correct names, (45) 551.
- production, (42) 636; (45) 344.
- production in—
 - Connecticut Valley, papers on, (50) 137.
 - Cuba, (42) 31.
 - Kamerun, (46) 232.
 - Nyasaland, handbook, (46) 227.
 - Philippines, (46) 232.
 - Porto Rico, (42) 439.
 - Southern States, (47) 233; (49) 231.
- propagation and seed bed studies, (48) 830.
- resistant to *Phytophthora nicotianae*, (48) 454.
- returns from, in Georgia, (49) 90.
- Réunion, culture in Mauritius, (42) 533.
- root knot, notes, (43) 246; (49) Fla. 838.
- root rot, control, (43) 447, Can. 735; (44) Ohio 155; (45) Can. 848; (47) Ga. 444.
- root rot, notes, (41) Md. 144; (43) 246, Mass. 845; (46) Ky. 848; (49) Fla. 838.
- root rot resistant strains, (47) Pa. 445, Wis. 446; (49) Ga. 537, Ky. 544.
- root rot, studies, (41) 248; (44) Wis. 241.
- root rot, temperature relation, (47) Wis. 446.
- rotation experiments, (43) Ky. 332, Ky. 824; (45) Ohio 126; (48) Ky. 129; (49) Ky. 524; (50) Can. 537.
- sand drown, cause, (48) 49, 454.
- sand drown, control, (47) N.C. 545.
- seed bed, fertilizer experiments, (42) 518.
- seed bed rot, control, (47) 248.
- seed bed, studies, (41) 644; (50) Can. 537.
- seed breeding, (44) 438.
- seed, germination, (41) 534.
- seed, limiting number of flowers for, (50) 640.

Tobacco—Continued.

- seed treatment, (47) 544.
- seedlings, *Pythium gracile* on, (43) 652.
- seeds, composition and use, (44) 201.
- seeds, iron and manganese content, (49) 202.
- selection experiments, (43) Pa. 533; (44) 438.
- shade-crop tests, (48) 830.
- slug, biology and control, (45) 558.
- smoke, nicotin content, (48) 750.
- soil, nutrient, and climatic requirements, (50) 236.
- soils, classifications, (43) Mass. 831.
- soils, studies, (46) Can. 817.
- soils, tillage experiments, (46) 715.
- South African, nicotin content, (48) 231.
- spacing and topping experiments, (43) Pa. 534.
- splitworm, notes, (44) 653; (47) 847.
- statistics, (46) 135.
- stem rot, notes, (49) N.C. 747.
- stems, fertilizing value, (41) N.C. 625.
- strontium in, (46) Colo. 28.
- substitutes in Germany, (43) 204.
- suckers, destruction, effect on flea-beetles, (45) N.C. 452.
- survey of literature, (44) 16.
- susceptibility to mosaic, (50) 352.
- tests of samples, (45) 340.
- textbook, (49) 36.
- thrips affecting, (45) 456.
- timothy as cover crop, (46) Conn.State 332.
- tokra disease, notes, (43) 445; (44) 445, 446.
- transpiration, (44) 518.
- Turkish, culture, (50) 33.
- Turkish, culture, curing, and marketing, (50) Calif. 538.
- untreated, nicotin in leaf and smoke, (50) 538.
- use as vermifuge, (43) Okla. 80.
- variation in nicotin content, (49) Ky. 524.
- varieties, (46) Can. 836.
- varieties, crossing, (47) 29.
- varieties, new cigar, (46) Ohio 333.
- variety tests, (42) Va. 436; (43) Md. 134, Can. 336, Pa. 533, Can. 735; (44) 633, 733; (45) 34, Can. 822; (46) 131, 836; (48) 830; (49) Va. 134, Alaska 426, Guam 427.
- warehouses, regulations, (44) U.S. D.A. 637.
- White Burley, strains resistant to root rot, (41) U.S.D.A. 39.
- wildfire—
 - control, (44) 749; (45) Conn. State 355; (46) Mass. 651; (48) Wis. 744; (49) 48, 545, 647, Conn.State 647.
 - description, (44) 749; (49) 647.
 - in Rhodesia, (48) 146.

Tobacco—Continued.

wildfire—continued.

notes, (46) Mass. 43, Ky. 848;
(47) Pa. 445, 544, Va. 843;
(48) Mass. 643; (49) 300, Wis.
643, Fla. 838; (50) 749.

studies, (47) Conn.State 544;
(48) Va. 246, N.C. 350, Mass.
847; (49) Conn.State 647.

temperature relation, (47) Wis.
446.

wilt, notes, (42) 546; (43) 245.

worms, studies, (43) Ky. 359; (45)
Guam 58.

wrapper leaf, development, (47) 326.

wrapper leaf, new type, (45) Conn.
State 133.

yields, factors affecting, (43) Mass.
830.

Tobosa grass range, maintenance, (47)
U.S.D.A. 468.

Toluene—

effect on activity of amylases, (46)
707.

effect on microbiological activities in
soil, (50) 620.

production from turpentine, (44) 806.

sulphonamin, p-, action of, (42) 174.

use as soil disinfectant, (42) 718.

Tolyposporium—

filiferum, notes, (48) 743.

spp., notes, (47) 544.

Tomato—

Alternaria fruit rot, (44) 847.

bacterial blight, studies, (41) Fla. 543.

bacterial diseases, (47) Pa. 445.

bacterial spot, studies, (45) 248, Ind.
248; (49) Ind. 538.

bacterial wilt, control, (43) Pa. 549.

black spot, (47) 753.

blight, control, (46) 745.

blight, early, studies, (42) 247; (44)
542; (46) Tex. 343.

blight, late, comparison with potato
late blight, (43) 447.

blight, late, control, (41) N.J. 52;
(43) 246.

blight, late, notes, (49) 149.

blight of seedlings, notes, (45) 541.

blight, studies, (43) Md. 151.

blight, western yellow, studies, (44)
Oreg. 840; (45) Idaho 240; (46)
144; (49) Wash.Col. 242.

blights, (43) 243.

blossom drop, notes, Okla. (43) 36;
(45) 449.

blossom-end rot, breeding for resist-
ance, (41) Ga. 145.

blossom-end rot, control, (46) Del.
640.

blossom-end rot, notes, (44) 48, Oreg.
841.

Botrytis rot and wilt, (45) Ohio 248.
breeding, (48) 38.

brown rot, (43) 154.

buckeye rot, distribution, (45) 546.

Tomato—Continued.

buckeye rot, notes, (41) Fla. 542; (45)
N.C. 442, 449; (49) 44.

canker in Holland, (44) 749; (47)
753.

canker, notes, (45) 849; (48) 741.

cannery inspection, reporting, (48)
U.S.D.A. 61.

catsup manufacture, (44) 117.

chlorosis, greenhouse, (41) 156.

collar rot, studies, (41) 841; (45)
249.

crown gall, studies, (50) 42, 745.

curly top, notes, (43) Pa. 548.

cuttings, root production in, (50) 300.

damping-off, (41) 841; (46) 447.

disease, new, (43) 544.

disease, new bacterial, (45) Ind. 142.

disease resistant strains, (47) Md. 235.

disease survey in India, (46) 544.

diseases, (42) U.S.D.A. 342, 349, 541;
(44) Ohio 151, 748, Oreg. 841; (45)

842, 848; (46) 447, 451; (47) 48;
(48) Can. 144; (49) 45, 149; (50)

148, 547.

diseases and pests, (46) 451; (47) Md.
832.

diseases in greenhouse, (45) 851.

diseases in Victoria, (43) 154.

diseases, key and remedies, (43) Can.
348.

diseases, notes, (41) 745; (43) 151,
Pa. 548.

edema, control, (43) Pa. 549.

end rot, (43) 243.

flea-beetle, notes, (42) N.J. 849.

fruit, double, structure and relations,
(42) 130.

fruit rot, greenhouse, (41) 156.

fruit rot, new, (50) 551.

fruit rots and sunburn, (48) 455.

fruit rots, origin and spread in transit,
(41) 156.

fungus disease, studies, (43) 447.

Fusarium disease, studies, (41) Minn.
745; (43) Ind. 345; (45) Okla. 449.

Fusarium root rot, (42) 247.

Fusarium wilt, notes, (43) Okla. 36,
243; (45) Ga. 47; (47) Calif. 646.

Fusarium wilt, relation to soil temper-
ature, (44) 847.

growth, physical factors in, (44) 727.

hardening process in, (46) Mo. 827.

Irish blight, notes, (43) 154, 244; (44)
49.

juice, antiscorbutic value, (46) 475.

juice, desiccated, antiscorbutic value,
(46) 359.

juice, use in infant feeding, (41) 266.

juice, vitamin C in, rate of destruc-
tion, (45) 563.

leaf blight, control, (43) Md. 151;
(44) Va. 746; (48) Va. 547.

leaf curling, cause, (48) 455.

leaf firing, notes, (46) Tex. 343.

leaf infections causing potato blight,
(47) 648.

Tomato—Continued.

- leaf mold, studies, (41) 843.
- leaf roll resistant variety, (46) 734.
- leaf spot, control, (43) 846; (45) N.J. 249; (46) 745; (48) 645; (49) Pa. 348.
- leaf spot, effect of fertilizers and lime, (50) 47.
- leaf spot, notes, (43) Okla. 44; (44) 48; (46) Mass. 43; (47) 753.
- leaf spot on horse nettle, (45) 546.
- Macrosporium foot rot, (46) 148.
- mealybug, notes, (41) 756.
- mosaic, studies, (43) 243, Ind. 345; (44) Oreg. 841; (45) Ind. 142; (50) 547.
- mosaic, organism associated with, (48) Mich. 644.
- mosaic, overwintering, (47) Ind. 147; (49) Ind. 538; (50) 655.
- mosaic, summary, (47) Ind. 449.
- moth, control, (43) 454; (46) 53.
- moth, habits and control, (44) 456.
- nailhead rust, notes, (41) Fla. 543.
- nematodes, control, (41) 846.
- Phoma rot, (47) U.S.D.A. 449.
- Phytophthora disease, (46) 848.
- Phytophthora rot, new, (41) 656.
- plants, absorption-transpiration ratio, (44) 323.
- products—
 - adulteration, (42) 113.
 - determining mold in, (47) 312.
 - examination, (44) 11, 12.
 - manufacture, (41) 618.
 - microorganisms in, (48) N.Y.State 610.
- pulp, vitamin A in, (49) 769, 8
- Rhizoctonia stem rot, (44) 847.
- Rhizoctonia, studies, (43) Wash. 749.
- root knot, control, (43) 47.
- root rot, notes, (43) 154; (45) Ga. 47; (50) 547.
- rot, control, (42) 48.
- rust in Costa Rica and Ecuador, (44) 747.
- rust, notes, (43) 346.
- rust, survey, (44) 749.
- Sclerotinia wilt, (46) 849.
- Sclerotium disease, (46) 543.
- seed, commercial utilization, (42) 212.
- seed distribution, (43) Ind. 338.
- seed growing, paper on, (42) 534.
- seed oil, studies, (41) 502; (45) U.S.D.A. 15.
- seed press cake, proteins, nutritive value, (46) 564; (49) 865.
- seed proteins, (47) 502.
- seed, selecting and saving, (43) Ind. 835.
- seedlings, damping-off, (45) 546, 652; (50) 352.
- Septoria, control, (44) 647.
- Septoria leaf spot, control, (47) Pa. 445.
- Septoria leaf spot, notes, (43) Okla. 36, Ind. 345.

Tomato—Continued.

- sleepy disease, notes, (43) 244, Pa. 549; (44) 49; (46) 543; (49) 647.
 - soft rot, control, (48) Va. 547.
 - soil pests, control, (41) 339.
 - spotted wilt, cause, (46) 451.
 - spotted wilt, notes, (43) 154.
 - spotted wilt, overwintering, (46) 745.
 - spotting, description, (50) 749.
 - stem disease, (44) 647.
 - stem end rot, (46) 849.
 - stem rot, new, (45) 541.
 - stem rot, notes, (43) 656; (44) 641; (46) 43, Del. 646, 844; (50) 547.
 - stigmanose, control, (43) Pa. 549.
 - stocks, potato grafted on, (47) 28.
 - strains, determining constancy, (50) 300.
 - streak disease, notes, (48) N.J. 345.
 - stripe disease, (44) 543, 647; (46) 447, 543.
 - thrips, notes, (47) Fla. 656.
 - waste, feeding value, (41) Del. 177; (44) Del. 366, 368.
 - watery rot, notes, (49) 844.
 - weevil, Australian, control, (49) 761.
 - weevil, Australian, in the South, (50) U.S.D.A. 57.
 - weevil, buff-colored, of Australia, (48) 852.
 - white leaf curl, control, (43) Pa. 549.
 - wilt and sweet potato stem rot, (45) 545.
 - wilt experiments, (50) 551.
 - wilt, location of organism, (49) Tex. 442.
 - wilt, notes, (41) Ariz. 345; (43) Okla. 44, 151, 656; (45) Ga. 52.
 - wilt organism, relation to pH, (48) Mo. 644.
 - wilt resistant seed, tests, (44) 648.
 - wilt resistant varieties, (41) Ill. 147; (43) 742; (46) La. 849; (47) U.S.D.A. 151, Ga. 444.
 - wilt, spotted, (46) 44.
 - wilt, spraying experiments, (46) 551.
 - wilt, studies, (41) Ga. 156; (44) La. 52; (49) Miss. 441.
 - winter blight, causes, (46) 844.
 - winter blight or streak, (50) 655.
 - winter blight, studies, (47) Pa. 445.
 - worms on tobacco, (43) Ky. 359.
 - yellow, studies, (47) Wash.Col. 541.
- Tomatoes—
- as a truck crop, (49) U.S.D.A. 833.
 - as affected by—
 - carbon dioxide, (42) 816; (44) 218; (45) 345, 834.
 - deteriorated calcium cyanamid, (43) 628.
 - limestone, (50) 300.
 - phosphatic fertilizers, (49) 726.
 - phosphoric acid, (49) 234.
 - phosphorus, (49) N.H. 336.
 - pruning, (44) Oreg. 836.
 - sodium nitrate, (46) 538.

Tomatoes—Continued.

- as affected by—continued.
 - soil disinfection, (42) 717.
 - soil electrification, (43) Ky. 824.
- as greenhouse crop, (44) Oreg. 834.
- blossom drop and yield, (49) 138.
- boom for spraying, description, (42) Va.Truck 893.
- breeding experiments, (41) N.J. 43, Ill. 147, 528; (42) 38; (43) Md. 144, Pa. 537, 741; (44) P.R. 442, Minn. 739, Pa. 740; (45) Guam 43; (46) 839; (47) Pa. 437, 832; (48) P.R. 235, Minn. 340, 442, 736; (50) P.R. 540.
- breeding for fly resistance, (41) Hawaii 146.
- can-house, cost of production, (46) N.J. 590.
- canned, bacterial flora, (46) 859.
- canned, standards for, (46) 15.
- canning, cost of production, (48) N.J. 387, N.Y.Cornell 787.
- canning, culture, (41) Mo. 340.
- canning industry, costs and profits, (45) N.J. 796.
- canning studies, (46) U.S.D.A. 664.
- canning, temperature changes in, (45) U.S.D.A. 560.
- carbon-nitrogen ratio for, (43) 430.
- changes in composition during ripening, (43) U.S.D.A. 834.
- Chrysophlyctis endobiotica on, (47) Pa. 444.
- citric acid in, (42) 315.
- cost of production, (44) 236, N.J. 338; (45) Ohio 134; (46) Miss. 590.
- culture, (43) Ky. 37; (44) Mont. 337; (48) N.Dak. 37, Minn. 338.
- culture experiments, (41) 339; (44) P.R. 442, Ariz. 532; (45) P.R. 633; (48) V.I. 340.
- culture, improved methods, (47) Mo. 237.
- culture in Guam, (42) Guam 37.
- culture in muck soil, (44) 719.
- dehydrated, bacteria and molds in, (48) 60.
- digestibility in stomach, (42) 862.
- dusting and spraying experiments, (48) Va. 547.
- dusting experiments, (45) 345, 552; (47) Va.Truck 236; (49) Va.Truck 233.
- early, culture, (48) Can. 38.
- effect on following crop, (44) R.I. 33; (47) Ind. 139.
- fertilizer experiments, (41) Mass. 21, Tex. 35, 339, 627; (43) Tex. 37, Ind. 338; Mo. 742; (44) R.I. 21, U.S.D.A. 441; (45) Ind. 134, Mo. 236; (46) N.H. 335, N.J. 537; (47) Ind. 139, Mo. 237, R.I. 419, Pa. 438, Miss. 439, R.I. 725, Ill. 830; (48) Ga.Coastal Plain 136, N.J. 339; (49) Miss. 234, Ohio 337, Tex. 436, 741; (50) Can. 340.

Tomatoes—Continued.

- fertilizers for, applying, (47) Mo. 237.
- for canning and manufacturing, (46) U.S.D.A. 139.
- forcing with neon light, (46) 640.
- from home selected seed, (50) Mont. 139.
- frost injury to, (48) U.S.D.A. 49.
- Fusarium resistant varieties, (43) Md. 151.
- grade specifications, (43) U.S.D.A. 144.
- grading system, (47) 637.
- greenhouse, culture experiments, (41) Ill. 147, Va.Truck 647; (45) 537, 538; (47) 339, 637.
- greenhouse, fertilizer experiments, (46) R.I. 233.
- greenhouse, pollination, (50) 300, Oreg. 834.
- growth and composition as affected by length of day, (49) 739.
- growth, daily course, (45) 333.
- hardiness, varietal differences, (46) 838.
- home-grown strains, (49) Mont. 136.
- hybrid, for Guam, (46) Guam 734.
- hydrocyanic acid injury, (46) 641.
- infection with *Macrosporium* tomato, (44) 155.
- insects affecting, (41) Fla. 548; (42) U.S.D.A. 342.
- irrigation experiments, (47) Calif. 637; (49) 138.
- keeping qualities in storage, (50) 139.
- lightning injury, (48) Can. 450.
- methods of training, (47) Miss. 831.
- mulching experiments, (41) Nebr. 648; (49) Ohio 337, 740.
- new strain, (42) N.J. 835.
- new varieties, distribution, (49) Pa. 232.
- nickel and cobalt in, (49) 520.
- nutritional studies, (47) 637.
- overhead irrigation studies, (50) Minn. 139.
- phosphorus requirements, (44) R.I. 31.
- pickled, spot of, notes, (49) 545.
- pollination studies, (43) 437; (44) Oreg. 836; (46) 734; (49) Oreg. 532.
- position in cluster as related to weight, (41) N.J. 43.
- potato wart disease on, (44) U.S.D.A. 154.
- preparation for market, (48) U.S.D.A. 596.
- preserving, in France, (42) 113.
- production, (47) Md. 832; (50) Calif. 741.
- production for canning, (47) Ind. 139.
- project study outlines, (44) 596.
- propagating in peat pots, (44) 40.
- pruning and training, (41) Kans. 41; (43) Ky. 37, 644.
- pruning test, (50) Can. 440.
- ripening process, (43) U.S.D.A. 834.
- root development, (43) 834.

Tomatoes—Continued.

- selection experiments, (41) N.Dak. 147; (45) N.Dak. 235; (49) Ill. 336, Guam 435, Ind. 531, Idaho 740. *Septoria lycopersici* on, (46) 46. soil sterilization for, (46) 641. spacing for field spraying, (44) 647. spray residue on, (47) U.S.D.A. 360. spraying, effect of pressure, (46) Va. Truck 336. spraying experiments, (41) N.J. 52; (42) 349; (43) 246, 656; (44) N.J. 341, 647; (47) Mo. 237, N.H. 449; (48) N.J. 350. staking, (43) Ky. 37, 339. sterilization, (46) 754. strain selections, (50) Minn. 139. strain test, (41) N.J. 41. sulphur content, (49) 436. sun-dried, vitamin content, (46) 359. test for earliness, (44) R.I. 40. tobacco leaf-folder affecting, (49) 759. varieties, (44) P.R. 442; (47) Ark. 741, Okla. 830; (49) U.S.D.A. 636; (50) Pa. 439. varieties susceptible to disease, (42) 448. variety tests, (42) Minn. 835; (43) Ind. 338, 833; (44) P.R. 236, Ariz. 532, 534; (46) N.H. 335; (47) Miss. 831; (49) Tex. 436. vitamin B in, (44) 261. vitamin C in, destruction by heat, (49) 563. vitamin C in, effect of heat and age, (45) 365. vitamin in, (41) 762; (48) 826. water-soluble vitamin in, (42) 759. wilting caused by walnut trees, (48) 451. winter disease of, (42) 541. yield and quality, (49) Miss. 234. yield and time of ripening tests, (50) Can. 339. yield as affected by irrigation, (50) Mo. 15. *Tomiscus chalcographus*, identification, (47) 258. Tongo, culture directions, (45) 35. Tongue lesions in foot-and-mouth disease, (44) 278. Tonsils of the dog, (47) 80. Toon shoot and fruit borer, life history, (42) 854. Toothwort, new host plant of, (44) 849. Tope liver oil, analysis, (48) 10. Topographic surveying manual, (48) 782. Topography, effect on temperature distribution in California, (44) U.S.D.A. 121. Topography, relation to frost, (43) 417. Tornadoes, papers on, U.S.D.A. (43) 511, 719. Torsion of crankshafts, (48) 887. *Tortricodes fragariana* n.sp., description, (41) 257.

Tortrix—

- albicomana*, notes, (41) Conn.State 159. *fumiferana*, see Spruce budworm. investigation, (44) 851.

Torula—

- botryoides*, notes, (50) 763. *cremeris* n.sp., description, (45) Iowa 176. *heveanensis*, notes, (49) 151. *lactis-condensi* n.sp., description, (43) Iowa 76. *sphaerica* n.sp., description, (45) Iowa 176. (*Trachytora*) *asperrima* n.sp., description, (49) 445.

Tosca, new genus, erection, (43) 853.

Toumeyella—

- liriodendri*, notes, (47) Conn.State 156. *parvicorne* (?), production of melezitose by, (42) 311.

Tourmalin, boric acid determination in, (43) 413.

Town—

- and country, service relations, (50) Wis. 691. and farmer, relation, (49) Wis. 690. v. country, treatise, (50) 892.

Toxicology, textbook, (44) 475.

Toxins and antitoxins, treatise, (45) 780.

Toxins, excretion from roots, (45) 821.

Toxoptera—

- coffea*, notes, (48) 252. *graminum*, see Green bug and Grain aphid, spring. *nigra* n.sp., studies, (42) 155.

Toxotrypana curvicauda, biology, (48) U.S.D.A. 56.

Trabutia portoricensis n.sp., description, (45) 338.

Trabutiella cordiae n.g. and n.sp., description, (45) 338.

Trachea fanitima cerivana, summary, (44) 753.

Trachelus tabidus, notes, (43) U.S.D.A. 363.

Trachelus tabidus, parasite of, (45) 663.

Trachycarpus excelsa seeds, vitality, (44) 425.

Trachycentra chlorogramma, notes, (43) 52.

Trachykele hartmani n.sp., description, (44) 165.

Trachypogon polymorphus for paper making, (42) 531.

Traction dynamometers, (46) 585.

Tractor—

- analysis, (44) 382. and other farm equipment costs, Mo. (45) 292; (46) 387. attachments, (42) 488. belt tests in Ohio, (42) 784. conditions in United States, (44) 687. construction, materials for, (46) 287. cultivation, summary of tests, (42) 283.

Tractor—Continued.

- drawbar pull, formula, (42) 283.
- drives for bad roads and rough land, (41) 887.
- efficiency, effect of wheel equipment, (48) 197.
- engine for alcohol as fuel, (45) 185.
- engines—
 - air cleaners for, (48) 197, 488; (49) 688, Calif. 688.
 - cooling, principles of, (43) 88.
 - design, (43) 88.
 - fuel efficiency and gear changes, (41) 886.
 - handbook, (42) 282; (46) 890.
 - lubrication, (43) 89.
 - starter for, description, (42) 282.
 - tests, (42) 197; (43) 287.
 - valves for, (43) 288.
- farming, cost, (41) 790.
- farming in New Jersey, (50) N.J. 90.
- farming, notes, (43) 892.
- fuel, kerosene for, (43) 891.
- gears, wrought steel for, (42) 783.
- hauling tests, effect of rubber tires, (42) 587.
- hitches, side draft studies, (49) Calif. 287.
- index, (46) 385.
- index, Chilton, (47) 90.
- law in Nebraska, Nebr. (42) 784; (45) 393.
- light, experience survey in Canada, (42) 282.
- motor lubrication and kerosene fuel, (47) Wis. 488.
- motors, studies, (48) 887.
- parts, standardization, (43) 89.
- plant, heat treating processes, (50) 388.
- plowing—
 - Ahart method, (47) 688.
 - cost data, (42) 785.
 - high speed, economies of, (42) 785.
 - in France, (42) 588, 785.
 - in India, tests, (42) 785.
 - in plats, technique, (44) 86.
 - in Tunis, tests, (42) 390.
 - laying out fields for, (41) U.S.D.A. 289.
 - notes, (41) 129, U.S.D.A. 384, 486, Pa. 486, 487, 790, 887, 888.
 - speeds, (43) 390.
 - tests, (42) 389, Mich. 389, 488, 587; (43) 690; (44) 86, 287; (46) 87, 88.
 - tests in Australia, (44) 587.
- power on farms, (43) Ariz. 788.
- pulley widths and speeds, (45) 892.
- radiator fans, design, (42) 686.
- spark arresters, tests, (42) Calif. 894.
- survey in Alabama, (48) Ala. 684.
- testing at Purdue University, (43) 287.
- testing law, (45) Nebr. 185.

Tractor—Continued.

- tests, (41) 486, 487, 887, 888; (42) 389, 487, 587, 588, Nebr. 784, 785; (43) 287; (44) 200, 587; (45) Nebr. 393; (47) 90, 791.
- tests in England, (47) 190; (50) 189.
- tests in Nebraska, (45) 392; (49) 791.
- tests in Scotland, (48) 487.
- tests on palm oil, (49) 590.
- tests, papers on, (48) 198.
- tests with angle iron cleat wheel equipment, (45) Ind. 186.
- troubles, remedies, (41) 791.
- weight, effect on drawbar pull, (42) 283.
- wheels, gripping devices of, (44) 200, 687.
- wheels, open or latticed, (49) Mich. 85.
- wheels, rolling resistance, (44) 485.
- Tractor-drawn binders, economy, (48) 186.
- Tractors—
 - agricultural, notes, (42) 487.
 - all-purpose, possibilities, (48) 487.
 - American, in English tests, (42) 587.
 - American v. Swedish, tests, (43) 690.
 - and cable tractors, (45) 589.
 - and horses on Corn Belt farms, relative adaptability, (48) U.S.D.A. 786.
 - and implements blue book for 1920, (43) 287.
 - and tractor implements, demonstration, (50) 287.
 - artillery, use in dam construction, (43) 89.
 - as an investment, (42) 184.
 - as means of farm power, (47) Mich. 688.
 - automatic uncoupling apparatus, (49) 85.
 - blue book, (45) 392.
 - caterpillar, for logging, (42) 785.
 - chain drive, tests, (42) 389.
 - chain track, (41) 887.
 - choosing for Corn Belt farms, (48) U.S.D.A. 888.
 - construction and assembly, (44) 485.
 - construction of parts and operation, (42) 588.
 - cost and utilization, (46) U.S.D.A. 383.
 - cost of operation, (45) 796; (48) 388, W.Va. 487; (50) N.J. 90.
 - cost of operation, in Great Britain, (42) 785.
 - cost on Corn Belt farms, (48) U.S.D.A. 888.
 - costs and accomplishment, (45) 392.
 - demonstration at Fargo, (46) 288.
 - demonstrations, (42) 84, Mich. 389.
 - demonstrations, educational value, (42) 95.
 - design, (42) 783; (43) 87.
 - design and economy, (50) 486.
 - design, factors affecting, (43) 592.
 - development, (43) 286; (47) 190; (48) 590.

Tractors—Continued.

- directory and specifications, (41) 586; (42) 892; (44) 887.
- drive wheel slippage, prevention, (46) 890.
- drive wheels, metal shoes for, (46) 586.
- dynamometers for, (46) 491; (47) 592.
- economy of operation, (43) 187.
- effect of speed on power required, (43) 288.
- effect on use of horses, (43) U.S.D.A. 690.
- farm and garden, treatise, (44) 382.
- farm, care and repair, (42) Mich. 694.
- farm, handbook, (42) 282.
- friction transmissions, (43) 89.
- gas, recent changes in design, (43) 88.
- gasoline, treatise, (42) 783.
- general purpose, history and development, (49) 889.
- general purpose, paper on, (50) 98.
- impulse starters for, (42) 783.
- in Arkansas, (49) Ark. 590.
- in Dakota farming, (41) U.S.D.A. 384.
- in Florida, (44) 687.
- in France, (43) 289.
- in Iowa farming, (43) Iowa 89.
- in Montana, (49) Mont. 485.
- in New Hampshire, (47) 191.
- in New York, (46) N.Y. Cornell 287.
- in Pennsylvania farming, (41) Pa. 486.
- in Tennessee farming, (43) 690.
- in United States, (43) 390.
- kerosene v. gasoline and steam, (42) 184.
- leveling device for hillside work, (46) 890.
- mechanical analysis, (43) 287.
- multi-purpose, for English conditions, (41) 885.
- on farms in Corn Belt, (44) U.S.D.A. 886.
- on farms in Corn Belt, effect, (48) 786.
- on southern farms, (48) U.S.D.A. 90.
- operating on producer gas, (47) 90.
- protection against freezing, (43) 484.
- ratings and belt speeds, (44) 786.
- reaction to various hitches, (48) 90.
- road work, factors in, (41) 885.
- selection and care, (50) N.J. 90.
- spark arresters, tests, (42) Calif. 894.
- status in England, (42) 588.
- status in United States, (42) 892.
- survey in Belgium, (45) 589.
- tendency to rise in front, (50) Calif. 189.
- track-laying, building, (43) 89.
- types for use in India, (49) 688.
- use in Connecticut, (44) 586.
- use in cultivating grapes and cereal crops, (42) 785.
- use in Italy, (42) 893.
- use in Kentucky, (43) Ky. 389.

Tractors—Continued.

- use in reclaiming swamp land, (43) 484.
- use of manganese steel in manufacture, (42) 783.
- use on sugar plantations, (42) 892; (45) 590.
- uses of ball and roller bearings, (49) 589.
- v. 8-mule outfit for road maintenance, (42) 484.
- v. horse labor, (45) Ill. 86.
- value and limitations, (47) Miss. 293.
- wheeled, studies, (41) 886.
- Trade and commercial prospects of East Africa, (48) 495.
- Trade unions, village, treatise, (44) 692.
- Tradescantia—
 - endurance of extreme conditions, (41) 220.
 - green shoots, vitamin A content, (46) 357.
- Traffic dictionary, (50) 593.
- Tragacanth ashes, fertilizing value, (43) 324.
- Tragacanth, mucilage in, origin, (43) 132.
- Trail construction in national forests, (49) U.S.D.A. 790.
- Trametes—
 - carnea, notes, (48) 147.
 - decussata, notes, (47) 547.
 - peckii, studies, (44) 27.
 - persoonii, notes, (49) 540; (50) 42.
 - pini, notes, (42) 50; (44) 347; (48) Can. 51.
 - pini on blazed trees, (46) 151.
 - pini on Douglas fir, (49) U.S.D.A. 755.
 - pini on maritime pines, (43) 755.
 - pini, studies, (42) U.S.D.A. 248.
 - radiciperda, notes, (41) 846.
 - radiciperda, soil conditions affecting, (49) 447.
 - serialis, studies, (47) U.S.D.A. 451.
- Transpiration—
 - and water transfer, relation to hardness, (45) 428.
 - and wilting in plants, (49) 521.
 - as affected by light, (43) 131.
 - effect of hardening of plants, (50) 300.
 - from leaf-stomata, (42) 129.
 - in apples, (46) 128.
 - in Hevea brasiliensis, (49) 626.
 - in plants, (46) 224.
 - in plants, negative pressure, (42) 334.
 - in plants, studies, (42) 629.
 - in Tilia americana, (43) 223; (48) 624.
 - negative pressure and water requirements, (43) 131.
 - negative pressure in, (44) 823.
 - of desert plants, seasonal changes, (46) 26.
 - of leaves, rôle of temperature, (44) 131.

Transpiration—Continued.

- of maritime plants, (43) 223.
- of plants, (41) 134, 222, 818.
- of plants, device paralleling, (41) U.S.D.A. 725.
- of plants, effect of peat, (47) 523.
- of tobacco and mullein, (44) 518.
- of trees, (41) 329.
- physics of, (49) 127.
- resistance of leaves to, relation to hairy coverings, (45) 527.
- studies, (44) 729; (47) Calif. 628.

Transplanting, season for, studies, (43) Mo. 142.

Transportation—

- and agriculture, (50) 490.
- problems in Iowa. (50) 586.
- rates relation to agriculture in Spain, (43) 488.
- systems of the United States, treatise, (50) 88.

Trapezeule on walnut, (47) 551.

Trapping, handbook, (46) 455.

Traumatic pericarditis in cows, (41) 474; (42) 878.

Traumatism, teratological phenomena following, (48) 433.

Traumatopisms, studies, (42) 229.

Treadmill operated by a bull, (44) Mont. 785.

Treater dust, potash determination in, (44) 804.

Treculia perrieri n.sp., description, (47) 129.

Tree—

- architectonics, studies, (43) 819.
- biology, treatise, (46) 221.
- borers, control, (49) Oreg. 357.
- chlorosis, notes, (43) N.Mex. 345.
- chlorosis, treatment, (42) 647; (43) 752.
- diseases, notes, (41) Mo. 654, 752; (42) 354.
- diseases, treatise, (44) 650.
- fern starch, digestibility, (47) 763.
- fern, starch from, (48) Hawaii 310.
- inoculation fake, warning, (48) 498.
- leaf hay, composition, (42) 63.
- life, redistribution, and readjustment, (47) 837.
- planting by farmers, (44) 838.
- planting, dynamite for, (43) 480.
- planting, notes, (44) Minn. 336.
- planting on the farm, (45) 745.
- pollen, distribution, (41) 46.
- products, effect on bacteriological activity in soil, (47) 812.
- protection examining board, report, (46) Conn.State 340.
- rots, notes, (45) 843; (46) 741.
- seeds, effect of soaking on viability and germination, (49) 440.
- seeds, germination, relation to soil moisture, (45) 140.
- seeds, germination tests, (42) 541.
- seeds, regulations in Ireland, (47) 39.

Tree—Continued.

- seeds, treatment and storage, (48) 448.
- surgery, (44) U.S.D.A. 339.
- toads, control of insects by, (44) 651.
- twigs, growth, (49) 128.
- wounds, treatment, (43) 349.
- Tree-banding material, formula, (44) U.S.D.A. 455.
- Treehopper, new, in Nova Scotia, (41) 354.
- Trees—
 - adaptability to nursery conditions, (47) Calif. 643.
 - adaptation in relation to hardiness, (41) 144.
 - American, in Scotland, (46) 737.
 - ancestors, (50) 240.
 - and forests, treatise, (44) 238.
 - and lightning, (48) 614.
 - and shrubs of Mexico, (49) 837.
 - annual rings, climatic effects, (43) 809.
 - annual rings, rôle in climatic study, (47) 226, 510; (49) 30.
 - as affected by—
 - hydrocyanic acid, (44) 223.
 - mistletoe in Mexico, (42) 354.
 - sodium chlorid, (43) 343.
 - as agents in condensation of moisture, (43) 16.
 - as good citizens, (47) 840.
 - as windbreaks, *see* Windbreak.
 - association with man, (45) 741.
 - Australian, crystals in, (41) 745.
 - Australian, for Mediterranean basin, (41) 744.
 - blazing, pathological effect, (46) 150.
 - branch orders and tolerance, (48) 42.
 - broad-leaved, behavior at Avondale, (49) 744.
 - bud variations in, (46) 721.
 - condition at Dickinson, (44) N.Dak. 40.
 - coniferous, *see* Coniferous and Conifers.
 - cultivation and care on farm, (47) Tex. 439.
 - culture at high altitudes, (47) 836.
 - culture experiments, (41) Nebr. 652.
 - culture in California, (49) 438.
 - culture in China, (48) 739.
 - dead and down, burning, (45) 350.
 - deciduous, pruning, (42) Calif. 832.
 - demonstration plantings, notes, (42) N.Dak. 738.
 - economic, in Great Britain, (43) 344.
 - economic, of China, (49) 745.
 - effects of copper wire on, (48) 433.
 - enemies of, (47) 443.
 - enzymes of, studies, (41) Del. 132.
 - exotic, adaptation in Westphalia, (42) 642.
 - exotic forest, at Mont Alto, (48) 449.
 - exotic, tests in Germany, (48) 839.
 - experimental planting in Australia, (45) 442.

Trees—Continued.

- falling foliage, cause, (46) N.J. 529; (48) 829.
- feeding, independent of roots, (50) 299, 834.
- field manual, (48) 236.
- foliage, variegation in, (43) 729.
- Fomes parasite on, (41) 658.
- food reserve in, (48) 625.
- for Arizona, (50) U.S.D.A. 138.
- for Hawaii, (41) 150.
- for Iowa, (43) 742.
- for Kansas, (41) Kans. 46.
- for Nebraska, list, (43) 240.
- for North Dakota, (41) N.Dak. 837.
- for planting on Arbor Day, (42) 141.
- for United Kingdom, (41) 343, 743.
- forest—
 - canker fungus on, (44) 842.
 - culture, (43) Nebr. 650.
 - description, (49) 837.
 - diseases, (42) 541.
 - for Idaho, Idaho (43) 650; (44) 640.
 - germination and culture of seeds, (46) 444.
 - growth rate and rainfall, correlation, (47) 836.
 - growth tests, (46) Kans. 444.
 - hybridization, (44) 46.
 - in National Arboretum in France, (45) 442.
 - insects affecting, (42) Ohio 54, 252; (50) 256.
 - light requirements, (50) Vt. 343.
 - liming experiments, (47) 241.
 - of District of Columbia, (50) 241.
 - of eastern United States, (47) U.S.D.A. 539.
 - of Georgia, (50) 543.
 - of India, (45) 745.
 - of Kentucky, manual, (50) 543.
 - of South Carolina, manual, (50) 40.
 - of Spain, catalogue, (44) 40.
 - of Western Australia, (50) 743.
 - seed tests, (44) 143.
 - significance of 255-year class, (50) 444.
 - viability of seeds, (46) 542.
 - winter injury, (43) 732.
- frustum form factor, (41) Vt. 47.
- Government distribution in Hawaii, (45) 745.
- growth—
 - and relation to thinning, (45) 447.
 - and sap concentration, (45) 124.
 - as affected by depth of planting (44) Oreg. 834.
 - as affected by humus, (47) 120.
 - in, (48) 824.
 - measurement with dendrograph, (45) 645; (46) 24.
 - rate in New Zealand, (42) 540.

Trees—Continued.

- growth—continued.
 - relation to climate, (42) 417, U.S. D.A. 619; (46) 27; (47) U.S. D.A. 414.
 - studies, (43) 819.
 - studies and yield tables, (45) 745, 819.
 - vertical, (42) 348; (44) 427.
- hardwood, on the farm, (44) U.S.D.A. 537.
- hardy, for Minnesota, (45) 644.
- hardy, in British Isles, (48) 736.
- height growth, relation to climate, (48) 539.
- identification, pocket guide, (49) 836.
- in London, manual, (48) 447.
- in relation to aerial life of beetles, (48) 358.
- in St. Thomas, fungus diseases, (50) 42.
- increment, determination by stem analysis, (45) 141.
- infertility of soil around, (48) 423.
- injury from mistletoes, (46) 245.
- insects affecting, (47) 848.
- interception storage loss, (42) U.S.D.A. 317.
- killing point, variation, (50) Minn. 126.
- killing with chemicals, (48) Calif. 588.
- leguminous, of Hawaii, (41) 344.
- measurement, (41) 47, 540, 840.
- measuring height, new method, (47) 42.
- nature lessons in, (45) 399.
- need along public highways, (46) U.S. D.A. 86.
- new, near Washington, D. C., (43) 222.
- northern broadleaf, culture in Australasia and South Africa, (49) 837.
- northern, in southern lands, (49) 836.
- of a mountain valley, (48) 641.
- of Bombay, morphology and ecology, (41) 244.
- of British Guiana, botanical identifications, (42) 348.
- of California, (50) 744.
- of Europe, guide, (44) 238.
- of India, (41) 839.
- of India, classification, (49) 143.
- of India, weights of seeds, (49) 141.
- of Indiana, (41) 46; (45) 644.
- of Java, epiphytes on, (46) 720.
- of Java, micrography, (41) 244.
- of Maryland, how to know them, (48) 840.
- of Mexico, (44) 40; (48) 43.
- of Mount Hood region, (44) U.S.D.A. 148.
- of Nebraska, handbook, (44) 640.
- of North America, treatise, (46) 737.
- of southern California, guidebook, (42) 348.
- of the Sierras, notes, (47) 345.
- of the world, treatise, (44) 443.

Trees—Continued.

- of United States, ray volume, (47) 346.
- of Virginia, characteristics, (49) 239.
- of West Indies, (46) 737.
- of West Virginia, manual, (45) W.Va. 240.
- of Yellowstone National Park, (50) 645.
- orientation of branches in space, (45) 31.
- ornamental—
 - culture experiments, (43) U.S. D.A. 339.
 - for Alaska, (44) Alaska 336.
 - for Minnesota, (42) Minn. 834.
 - for Missouri, (44) 45.
 - for Ohio, (43) Ohio 342.
 - for Wisconsin, (41) 242, 835.
 - from China, (41) 448.
 - hardy, new in cultivation, (41) 448.
 - in homestead development, (49) Ohio 298.
 - in South Africa, (43) 441.
 - new and rare, (42) 641.
 - pruning, (45) 348.
 - varieties, (49) U.S.D.A. 636.
 - variety tests, (42) 343; (43) U.S. D.A. 339; (47) Minn. 338.
 - winter injury, (41) Ariz. 343, 448; (43) 753.
- Philippine dipterocarps, anatomical features and properties, (49) 143.
- planting—
 - along highways, (42) Mich. 694.
 - in Canada, (50) 344.
 - in Great Plains, (49) U.S.D.A. 141.
 - in national forests, (50) 344.
 - in the country, systematic, (42) 539.
 - on prairies of Canada, (46) 843; (48) 640.
- precipitation under, (41) 315.
- propagation, (46) 843; (47) Tex. 439.
- pulping values, (50) 142.
- regional spread of moisture in, (44) 341.
- repairing, (47) 835.
- resetting, effect of orientation in, (50) 225.
- roadside, management, (43) 543.
- roadside, planting, (47) Mich. 835.
- Rocky Mountain, physiological requirements, (49) 535.
- root habit in the far North, (41) 634.
- shade—
 - and ornamental, tests, (45) N. Dak. 239.
 - care of, handbook, (49) 439.
 - distribution of insects affecting, (43) 159.
 - for Idaho, Idaho (43) 650; (44) 640.
 - for Ohio, (43) Ohio 342.

Trees—Continued.

- shade—continued.
 - insects affecting, (41) 755; (42) Ohio 54; (45) 254, 455; (48) 252; (49) 51; (50) 153.
 - kerosene injury to, (43) 732; (45) 541.
 - leaf scald, (48) N.J. 346.
 - of Texas, (45) 348.
 - protection for, (43) Ohio 746.
 - variety tests, (42) U.S.D.A. 343.
 - winter work in insect control, (42) Ohio 451.
- shelter-belt—
 - plantations on northern Great Plains, (48) U.S.D.A. 448.
 - planting, (49) Mont. 137.
 - tests, (49) 240.
- smoke injury, (46) 434.
- smoke injury, indicator for, (47) 129.
- street, gas poisoning in, (45) 54.
- street, laws for protection and planting, (43) Mich. 342.
- street, planting and care, (46) U.S.D.A. 41.
- street, selection and care, U.S.D.A. (42) 538; (47) 145.
- tall, dusting by airplane, (49) 654.
- tan-yielding, cultural studies in India, (42) 44.
- thinning experiments, (41) 744.
- tolerance of, use of term, (43) 840.
- transpiration, (41) 329.
- transplanting, fall v. spring, (43) Mo. 141.
- tropical, with light-weight wood, (48) 345.
- wilting coefficient tests, (49) 536.
- wound dressing, new, (49) Ohio 235.
- young, pruning experiments, (49) N.H. 336.
- Trematodes, summary, (50) 51.
- Trench fever, (41) 851; (47) 482.
- Trench fever, relation to lice, (41) 551.
- Trench-foot, relation to diet deficiency, (41) 365; (43) 168.
- Trenching machines, (44) U.S.D.A. 86.
- Treponema cuniculi, notes, (48) 183.
- Trialeurodes floridensis, notes, (43) 851; (47) U.S.D.A. 157.
- Trialeurodes inaequalis n.sp., description, (50) 556.
- Trialeurodes vaporariorum, *see* Whitefly, greenhouse.
- Triatoma megistus, notes, (43) 182.
- Tribolium—
 - confusum, notes, (41) 57; (44) Minn. 753; (48) 652; (50) 51.
 - confusum, nutritional requirements, Minn. (47) 357; (50) 152.
 - confusum, studies, (41) 358.
 - spp., notes, (41) 759.
- Tribulosis ovium, paper on, (44) 76.
- Tribulus terrestris, notes, (44) 439.

Tricalcium—

- arsenate, preparation and instability, (46) 613.
- phosphate, effect on composition of soil extracts, (43) Mich. 124.
- phosphate v. aluminum and iron phosphates, (48) 622.

Trichinae—

- as affected by pork-curing processes, (44) U.S.D.A. 79.
- effects of heat on, (41) 684.
- in pork, destruction through freezing, (48) 882.
- vitality in American bacon and hams, (48) 679.

Trichinella spiralis as affected by—

- pork-curing processes, (44) U.S.D.A. 79.
- X-ray, (45) 182.

Trichloroacetaldehyde, effect on catalase production, (42) 708.

Trichogramma—

- minutum, notes, (50) Mass. 659.
- minutum, parasitism by, (43) Mass. 159; (45) 59, 856.
- pretiosa, parasitism by, (43) 759.

Trichogrammatoidea lutea, parasitism by, (44) 167.

Trichomalus fasciatus, parasitism by, (47) 551.

Trichomitus termitidis, studies, (41) 464.

Trichomona cariniventris, parasitism by, (44) 167.

Trichomonas—

- hominis, notes, (49) 477.
- suis, infection in sheep, (45) 385.
- suis, notes, (46) Ky. 884.

Trichopoda pennipes, notes, (44) 549; (48) 853.

Trichosanthes dioica, Pseudoperonospora cubensis on, (50) 148.

Trichosomoides crassicauda, migratory course in host, (44) 858.

Trichosporium—

- palmicolum, notes, (47) 547.
- sp. on Brie cheese, (42) 877.
- vesiculosum on filao trees, (42) 354.

Trichostrongyles, control, (49) 77.

Trichostrongylus retortaeformis, notes, (47) 252.

Trichothecium roseum, notes, (47) 546.

Trichothrips, key, (41) 847.

Trichuris—

- depressuscula extracts, experiments, (46) 379.
- ovis in sheep, (46) 685.
- treatment for, (49) 788.

Tricolysa bomycis, notes, (49) 154.

Tricophyton spp., notes, (47) 678.

Trifidaphis radicularis, notes, (47) N.Y.Cornell 848.

Trifolieae, anatomical studies, (46) 222.

Trifolium—

- fragiferum var., new forage plant, (43) 528.

Trifolium—Continued.

- lupinaster, culture, Alaska (41) 31; (44) 329.
- squarrosus, description and habitat, (48) 440.

Triglochin maritima, habitat, (44) 820.

Trigonura—

- annulipes n.sp., parasitism by, (44) 356.

- hicoloriae n.sp., description, (41) 463.

Trimeromicrus maculatus, notes, (43) U.S.D.A. 365.

Trimethylamin, cause of fishiness in butter, (42) N.Y.Cornell 565; (50) Wis. 279.

Trinitrotoluol—

- for land clearing, (44) Wis. 284.
- for rock and soil blasting, (43) 480.
- modified, for blasting, (44) U.S.D.A. 585.
- use in blasting stumps, (46) U.S.D.A. 85.
- use in road construction, (44) U.S.D.A. 585.
- use under water, (42) 278.
- water resisting properties, (43) U.S.D.A. 282.

Triodontophorus intermedius, studies, (42) 776.

Triodontophorus tenuicollis, notes, (42) 678.

Trionymus trifolii, notes, (47) 657.

Trioxymethylene powder for mosquito control, (43) 853.

Trioxys cupressicola n.sp., description, (41) 63.

Triozia—

- merwei, life history and habits (50) 257.
- merwei n.sp., description, (50) 155.
- tripunctata, life history and habits, (49) N.J. 353.
- viridula, notes, (46) 153.

Triphenylmethane dyes, antiseptic value, (41) 474.

Triphragmium trevesiae n.sp., description, (46) 829.

Triplite as source of phosphoric acid, (41) 817.

Tripolycystus cryptognathae, notes, (45) 459.

Trisetum subspicatum, analyses, (41) Wyo. 333.

Trissolcus edessae, notes, (43) 259.

Tristachya rehmanni for paper making, (42) 531.

Tri-State Development Congress, report, (46) 292.

"Tristeza"—

- cause, (43) 182.
- new parasite of, (45) 883.

Trochilidae, synopsis and catalogue, (46) 555.

Trochorrhopalus strangulatus, notes, (43) 52.

Trogoderma khapra, control, (47) 258; (48) 358.

- Trogoderma khapra* larvae, lethal temperatures, (47) 358.
- Trombicula**—
 akamushi, studies, (42) 451.
 in America and Orient, (45) 259.
 mediocris, notes, (43) 260.
 spp., descriptions, (46) 560.
 tlalzahuatl, notes, (50) 762.
- Trombididae** of Minnesota, (41) 57, 360.
- Trombidium**—
 akamushi, notes, (43) 260.
 sp., notes, (47) S.Dak. 451.
- Trona* potash, fertilizing value, S.C. (43) 126; (46) 717.
- Tropaeolum majus* flowers, genetics of coloration, (43) 328.
- Tropical**—
 agriculture, *see* Agriculture.
 disease and sanitation, (44) 653.
 garden in Florida, notes, (48) 199.
- Tropism**—
 of plants, Weber's law, (45) 626.
 studies, (45) 629.
 transmission of stimulus causing, (44) 823.
- Troughs**, concrete, construction, (43) 90.
- Trout**, diallel crossings with, (46) 268.
- Trout**, vertebrae in, variation, (47) 865.
- Truck crop**—
 diseases, (41) Fla. 542; (47) Minn. 347; (49) Ind. 537; (50) Minn. 143, Pa. 445.
 diseases in Maryland, (44) 747.
 seed production, (45) Idaho 235.
- Truck crops**—
 booms for spraying, (42) Va.Truck 893.
 climatic requirements, (41) U.S.D.A. 417.
 cultivation, implements for, (43) 892.
 dusting experiments, (47) Va.Truck 236.
 for small farmers in California, (42) 593.
 Fusarium diseases, (41) Minn. 745.
 insect control on, (48) U.S.D.A. 457.
 insects affecting, (41) Fla. 455; (45) 551; (47) 359; (49) V.I. 654; (50) V.I. 555.
 insects affecting, nicotin sulphate dust for, (44) U.S.D.A. 651.
 mosaic diseases, (47) Iowa 749.
 production in Virginia, (47) U.S.D.A. 318.
 returns from, in Georgia, (49) 90.
 variety tests, Tex. (41) 35; (43) 36.
- Truck farms**—
 in New Jersey, studies, (42) 290.
 survey, (46) N.J. 590.
- Trucks**, *see* Motor trucks.
- True**, A. C., biographical sketch, (49) 2.
- True**, A. C., tribute of appreciation, (49) 706; (50) 895.
- Trychonympha campanula* n.sp., studies, (41) 464.
- Trypaneidae**—
 new genera and species, (45) 257.
 of Brazil, (41) 758.
- Trypanosoma**—
 americanum, studies, (47) 485.
 cruzi in tissues of armadillo, (49) 180.
 cruzi, notes, (43) 57, 182.
 cruzi, occurrence, (48) 879.
 equinum, notes, (48) 883.
 equiperdum—
 arsenic-fastness, effect on treatment with arsphenamin, (49) 479.
 biology, (48) 677.
 effect of Bayer 205 on, (49) 680.
 rendered uninfected, (49) 683.
 guyanense n.sp., notes, (41) 878.
 lewisi in Boston rats, (46) 279.
 lewisi, parasite of rat, (43) 883.
 life cycle, (41) 781.
 marocanum, notes, (49) 400.
 melophagium, notes, (49) 182; (50) 357.
 ruandae, proposed name, (47) 184.
 spp., action of Bayer 205 on, (50) 184.
 spp., notes, (44) 376, 580; (50) 584.
- Trypanosome** infections, resistance of hosts to, (47) 882.
- Trypanosome** of carabao, (43) 472.
- Trypanosomes**—
 carried by dourine cured stallions, (44) 583.
 of cattle, (46) 484.
 of domestic mammals, (41) 284.
 remedy, (47) 82.
- Trypanosomiasis**—
 American, summary, (43) 182.
 control, (49) 400; (50) 584.
 immunity reaction, (41) 190.
 in British sheep, (49) 182.
 notes, (48) 579.
 of animals in Venezuela, (44) 580.
 of horses, (45) 881.
 of Ruanda, (47) 184.
- Trypetidae**, North American, revision, (50) 457.
- Trypsin**—
 determination, (47) 803; (48) 611.
 in calf fetus, (44) 865.
 in pollen, (48) 728.
- Trypsinoids**, use of term, (45) 279.
- Tryptophan**—
 colorimetric studies, (45) 311, 313.
 determination, (43) 504; (50) 204.
 determination and isolation, (46) 112.
 determination in proteins, (47) 504; (48) 313.
 effect on starch hydrolysis, (46) 708.
 in foods, (46) 758.
 in milk serum, (49) 802.
 in plants, detection, (48) 503.
 in proteins, (48) 312.
 in urine, detection, (43) 316.
 new reaction, (49) 110.

Tryptophan—Continued.

- preparation, (49) 714.
- requirement of adults, (46) 758.
- requirement of rats, (49) 158.
- stability, (46) 112.
- test for, (45) 110.

Tsetse fly, relation to sleeping sickness, (45) 761.

Tsutsugamushi disease—

- carriers, (42) 451; (46) 560.
- studies, (41) 753.

Tubatoxin, insecticidal value, (49) 152.

Tubercle bacilli—

- action of oils on, (46) 579.
- alcoholic extracts, preparation and antigenic power, (45) 384.
- and extracts, antigenic power, (48) 379.
- antigenic value of methyl alcohol extract, (46) 376.
- as affected by creosote and guaiacol, (44) 279.
- as affected by potassium dichromate, (47) 184.
- as affected by ultra-violet rays, (47) Wis. 482.
- attenuated, for tuberculosis control, (41) 85.
- avian, from a pig, studies, (47) 585.
- bile-treated, studies, (46) 581.
- bovine, rôle in human tuberculosis, (46) 174.
- composition, (45) 77.
- effect of chaulmoogra oil, (45) 582.
- growth as affected by amino acids, (44) 580.
- human and bovine, (49) 380.
- human, bovine, and equine, comparison, (41) 878.
- lipoids, biological properties, (50) 584.
- metabolism, (42) 177.
- methyl extract, immunizing properties, (48) 280, 483.
- occurrence in normal udders and blood, (47) 485.
- solubility in benzyl alcohol, (43) 584.
- solubility in specific immune substances, (43) 583.
- strains, (50) 882.
- transmission by eating utensils, (46) 361.
- types in human tuberculosis, (43) 686.
- types, significance, (46) 683.
- virulence among cattle in India, (44) 279.

virulence in cheese, (42) 179.

Tuberculariaceae on box, (43) 849.

Tuberculin—

- antigenic properties, (47) 386.
- avian, for detection of Johne's disease, (44) 682.
- comparative sensitiveness from dead or avirulent tubercle bacilli, (50) 284.
- determination, (41) 877.
- effect of benzyl alcohol, (45) 481, 482.

Tuberculin—Continued.

- effects, (47) 83.
- failure during and after gestation, (42) 569.
- hypersensitiveness induced by bacillus-free filtrates, (46) 182.
- immunity and antigenic action, (48) 777.
- preparation, (47) 386.
- preparation and distribution, (42) 380.
- reaction, studies, (46) 376.
- reactions and dead bacilli, (50) 381.
- sensitiveness due to dead tubercle bacilli, (50) 480.
- standardization, (45) 582; (50) 80.
- test—
 - in Mauritius, (42) 273.
 - intradermal, (42) 273, Calif. 882; (43) 683; (46) 482; (47) 83, 878.
 - intrapalpebral, (47) 386.
 - intrapalpebral, technique and value, (48) 281.
 - ophthalmic, directions, (47) 83.
 - ophthalmic, use, (46) 182.
 - research work, (44) Minn. 778.
 - retesting of reactors, (42) 477.
 - subcutaneous, directions, (46) 182.
- testing in Michigan, (41) 284.
- testing, pitfalls in, (45) 679.
- tests—
 - accuracy, (45) Wis. 283.
 - and retests, (43) 81.
 - combination, (45) 282; (46) 182.
 - comparison, (45) 482; (48) 277.
 - improper, (45) 77.
 - in cattle, (46) 183; (49) 783.
 - lecture on, (42) 675.
 - lymphangitis reaction to, (41) 782.
 - of fowls, (46) 280; (48) Calif. 582.
 - of livestock, (48) U.S.D.A. 582.
 - recording, (46) 482.
 - technique, (47) 882.
 - value, (41) 781.
 - value in maintaining a tubercular-free herd, (49) N.Y.State 380.
- Tuberculina maxima, studies, (42) 51.
- Tuberculin-reacting areas, results of virulent reinfection, (44) 682.
- Tuberculins, preparation, (45) 282.
- Tuberculinization, double local reaction, (49) 78.
- Tuberculosis—
 - and beef industry, (42) 877.
 - and dairy industry, (42) 877.
 - avian, (45) 680; (46) 775; (47) 184, 682; (48) 779.
 - avian, and its bacillus, (49) 180.
 - avian, in cattle, (50) Wyo. 381.
 - biochemistry and chemotherapy, (44) 279; (45) 581; (49) 379.
 - bovine—
 - control, (43) 272; (45) 680; (46) 377.

Tuberculosis—Continued.

- bovine—continued.
 - diagnosis, (42) 273; (45) 684; (48) 483; (49) 180.
 - economic and sanitary significance, (43) 81.
 - eradication, (43) U.S.D.A. 471; (44) 683; (50) Alaska 787.
 - in children, (41) 85.
 - in Great Britain, (50) 182.
 - in Hawaii, (49) 378.
 - nonspecificity of complement fixation test for, (49) 78.
 - paper on, (42) 877; (43) 683; (46) 881.
 - prevention, (47) 386.
 - protective ferments in, (45) 685.
 - treatment, (42) 380.
- chaulmoogra oil for, (45) 582, 884.
- chemistry of, (48) 776.
- chemotherapy, (43) 584.
- complement fixation reaction in, (41) 190; (44) 279; (48) 880; (49) 78; (50) 584.
- complement fixation test for, (42) 178, Calif. 882; (43) 278, 687; (45) 77; (46) 482; (49) 883.
- control, (41) 474, U.S.D.A. 479, U.S.D.A. 683, 777, 878; (42) 477, 877; (43) 272, 780; (44) Alaska 377; (45) 781; (50) Calif. 788.
- control in Alabama, (42) 776.
- control in Illinois, (44) 183.
- control in Massachusetts, (46) 681.
- control in Pennsylvania, (44) 183; (47) 485.
- diagnosis, (41) 478, 878; (46) 276; (47) 285, 386, 682, 788; (48) 879; (50) 584.
- diagnosis and prognosis, (44) 681.
- diagnosis, new serum reaction, (49) 680.
- differentiation from lymphangitis in cattle, (41) 782.
- dish towel as source of infection, (50) 381.
- epidemiology, (44) 580.
- eradication, (44) 183; (45) 73; (49) 178; (50) 81.
- eradication—
 - accredited-herd plan, (43) 473, U.S.D.A. 473; (44) U.S.D.A. 478, U.S.D.A. 479; (45) 177; (46) 482; (48) Calif. 583.
 - conference, (42) 380.
 - cooperative, (44) 780; (45) 884.
 - from cattle and swine, (42) 877.
 - herd list, (42) U.S.D.A. 380.
 - in cattle and pigs, (48) 484.
 - in Pennsylvania, (45) 283, 582.
 - methods, comparison, (43) 473.
- experimental, in rats on varied diets, (49) 859.
- experimental, nutrition in, (49) 479.
- focal reaction in, (46) 280.

Tuberculosis—Continued.

- human, rôle of bovine type in, (46) 482.
- human, transmission to fowls, (43) 687.
- human, types, (43) 686.
- immunity, duration of, (44) 780.
- immunity, leucocytic response, (45) 582.
- immunization, (44) 681, 682; (45) 384, 684; (47) 882; (50) 80.
- immunization, oral route for, (50) 478.
- immunization with bile-treated bacilli, (46) 182.
- immunizing rabbits and guinea pigs against, (48) 483.
- immunizing vaccine, (46) 280.
- immunotherapy and chemotherapy in, new attempts, (49) 783.
- in Canada, (47) 181; (48) 583.
- in Denmark, discussion, (50) 184.
- in Great Britain, (46) 178.
- in India, control, (47) 878.
- increase during the war, in Germany, (44) 580.
- intradermal tuberculin tests, (42) 273, Calif. 882; (43) 683; (46) 482; (47) 83, 878.
- lecture on, (42) 675.
- literature in France, (45) 77.
- nonspecific cutaneous reactions in, (49) 282.
- notes, (41) 280; (49) 278.
- of children, types of organism, (49) 479.
- of farm animals, (44) 278; (47) Wis. 482.
- of goats, (45) 685.
- of guinea pig, immunization, (45) 684.
- of horses, summary, (42) 569; (46) 482.
- of livestock in United States, (49) 282.
- of livestock, summary, (42) U.S.D.A. 273.
- of pigeons, (45) 787.
- of pigs, control, (48) 176.
- of poultry, (41) Iowa 88; (45) U.S.D.A. 386; (46) Idaho 686; (48) 284.
- of poultry, wattle test for, (45) Wis. 286.
- palpebral test for, (47) 386, 882; (48) 281.
- papers on, (45) 679.
- prevention and control, (47) 184.
- pulmonary, diagnosis, (44) 376.
- reference book, (46) 182.
- relation of heredity to, (49) 567.
- relation to malnutrition, (46) 869.
- resistance of guinea pigs to, (44) 780.
- resistance, rôle of lipoids in, (42) 569.
- serological studies, (42) 882; (45) 282.

Tuberculosis—Continued.

- spread among cattle, (44) 580; (45) 788; (48) 277.
- status, (43) 584.
- studies, (47) Calif. 682.
- transmission by table utensils, (48) 659.
- transmission in hog cholera inoculations, (46) Mo. 379.
- transmission, studies, (43) 81, 685.
- treatise, (45) 181; (48) 777; (50) 584.
- treatment with aromatic hydrocarbons, (41) 682.
- treatment with chaulmoogric acids, (42) 777.
- treatment with sodium chaulmoograte, (44) Calif. 780.
- treatment with sodium morrhuate, (42) 777.
- vaccine as affected by ultra-violet rays, (47) Wis. 482.
- vaccine, preparation, (45) 582.
- value of flavin compounds in, (46) 775.

Tuberculous—

- blood, fat content, (41) 764.
- blood, phagocytosis in, (41) 187.
- cattle, State detention farm for, (42) 878.
- infection, effect of protein intoxication on, (41) 190.
- meat, detection, (41) 191.
- serums, antitoxic power, (41) 878.

Tuberization and tumefaction, (50) 326.

Tubers, diseases, (42) 242.

Tubers, vitamins in, (42) 460.

Tukra disease of mulberry, (47) 255.

Tularaemia—

- disease in man, (47) 559; (49) 455.
- in Washington, D. C., market, (49) 784.
- occurrence and transmission, (46) 151, 662.

Tule lands, reclamation, (42) 17; (43) Oreg. 21.

Tulip—

- Botrytis blight, (46) N.Y.Cornell 654.
- bulb dry rot, (46) 544.
- bulbs, distribution, (42) U.S.D.A. 346.
- bulbs, failure, (42) 50.
- bulbs, production, (48) U.S.D.A. 238.
- bulbs, treatment and storage, (46) Can. 236.
- droppers, description, (42) 43.
- leaves, frost necrosis, (43) 849.
- petals, plasmolysis of epidermal cells, (41) 818.
- poplar, cause of brashness, (45) 46.
- tree region, beekeeping in, (47) U.S.D.A. 57.
- tree scale, control, (47) Conn.State 156.
- trees, time for transplanting, (43) Mo. 142.

Tulip—Continued.

- white spot, (44) Conn.State 150.
- wood, Brazilian, identity, (46) 843.
- Tulips, doubling, monograph, (41) 742.
- Tulips, varieties, (42) U.S.D.A. 346.
- Tulips, wild, growth behavior, (41) 742.
- Tumefaction and tuberization, (50) 326.
- Tumidiscapus orthopterae n.sp., description, (41) 360.
- Tumor-like plant formations, (49) 820.
- Tumors—
 - and wounds, (49) 279.
 - bacterial, production, (47) 50.
 - epithelial, in domestic animals, (45) 382.
 - nature and cause, treatise, (42) 878.
- Tuna fish meal, production, (49) 122.
- Tung oil, acid number determination, (47) 202.
- Tung oil, test, (48) 711.
- Tunis grass, culture experiments, (45) Kans. 33.
- Turbidimeters, description, (43) 413, 614.
- Turbidimetry substitution for nephelometry, (45) 805.
- Turf-dike fencing, (49) 586.
- Turkey entero-hepatitis, remedies, (42) Calif. 887.
- Turkey pox, transmissibility, (42) Calif. 886.
- Turkeys—
 - factor in spread of gapeworms, (45) U.S.D.A. 77.
 - feeding, (47) 377.
 - feeds and feeding, (41) Can. 370.
 - incubation and brooding, (45) N.J. 286.
 - intestinal protozoa, effect of chaparro on, (45) 484.
 - management, (50) Mont. 73.
 - management in South Africa, (50) 375.
 - raising, (42) 563; (45) 474; (47) 487, Calif. 673.
 - raising in Argentina, (49) 171.
 - raising, treatise, (47) 276.
 - raising with special reference to black-head, (43) 475.
 - respiration, (48) 680.
 - water, under-water activities, (48) 51.
 - wrapping heads for market, (42) U.S. D. A. 376.
- Turmeric, culture experiments, (44) 137.
- Turnip—
 - aphids, control, (49) Wis. 653, N.C. 757; (50) Conn.State 50.
 - bacterial disease, (50) 352.
 - diseases, (48) Can. 144.
 - dry rot, studies, (41) 657.
 - finger-and-toe disease, (43) 47.
 - finger-and-toe disease, lime for, (41) 451.
 - finger-and-toe disease, relation to pH of soil, (49) 845.
 - gall weevil, notes, (47) 556.
 - gall weevil, studies, (50) 57.

Turnip—Continued.

- greens, iron content, (48) 159.
- maggot, summary, (47) Idaho 258.
- mosaic disease, (46) 148.
- root galls, notes, (45) 842.
- seed, oil extraction from, (44) 436.
- soft rot, notes, (48) 242.
- steckling rot, (48) Can. 144.
- stecklings, storage, (45) Can. 823.
- straw, hydrolyzed, feeding value, (48) 265.
- tops, sun-dried, vitamin content, (46) 359.

Turnips—

- as affected by phosphates, (48) 521.
- as affected by potash and kainit, (44) 515.
- as cover crop for peaches, (41) Del. 145.
- ash constituents, (41) 502.
- breeding experiments, (41) 797; (43) Can. 735; (45) 822; (44) 434.
- carbohydrates in, (42) 202.
- carbon-nitrogen ratio for, (43) 430.
- culture, (42) Wyo. 135; (43) 638; (44) Hawaii 29, Alaska 328, 436, Alaska 522, Alaska 532; (47) Minn. 334, Alaska 535.
- culture and storage, (45) Wis. 229.
- culture experiments, (41) 229, 334, Can. 528, 729, 737; (43) 638; (44) Alaska 329, 632; (45) Kans. 33, Can. 823; (49) Alaska 426.
- culture on bog soil, (41) 230.
- culture on peat soil, (43) 23; (45) 735.
- dried, bacteria and molds in, (48) 60.
- dried, feeding value, (42) 369.
- effect of deep cultivation, (44) 812.
- effect on water extract of soil, (44) 719.
- Erysiphe polygoni on, (45) 351.
- feeding, effect on flavor of milk, (50) U.S.D.A. 377.
- feeding value, (41) Can. 567; (43) Can. 771; (48) 876.
- fertilizer experiments, (41) 229, 334, 425; (42) 223; (43) Can. 735; (46) 227; (47) 322.
- following oats and legumes, (41) 231.
- green shoots, vitamin A content, (46) 357.
- growth in alkali soil, early, (42) Utah 28.
- nutritive value, (41) 557.
- on partially sterilized soils, (41) 515.
- Peronospora on, (45) 546.
- phosphorus requirements, R.I. (44) 31, 32.
- rotation experiments, (41) R.I. 434.
- seed production, (45) 740, 832.
- seed production in Denmark in 1918, (42) 135.
- seed size as affecting yield, (41) 536.
- seeding dates, (46) 531.
- seeding experiments, (46) 227.

Turnips—Continued.

- sodium for, (41) R.I. 426.
- storage experiments, (43) Can. 735.
- sun-dried, vitamin content, (46) 359.
- surface treatment for maggots, (49) N.H. 854.
- thinning and harvesting, (49) 86.
- time of sowing, (41) 234.
- v. sunflower silage for steers, (50) Can. 468.
- varieties for oil production, (44) 138.
- varieties, yields, (47) Mont. 131.
- variety for Alaska, (41) Alaska 30.
- variety tests, (41) 334; (43) 232, 638, Can. 735; (45) 532; (46) 227, N.H. 328; (47) Minn. 332, Calif. 631, Miss. 831; (48) 32, Can. 227, Minn. 331; (50) Can. 432.
- vitamin B in, (44) 261.
- vitamins in, (41) 762.
- water-soluble vitamin in, (42) 759.
- weeding experiments, (41) 737.
- yields, (43) Minn. 824; (46) 533.

Turpentine—

- beetle, red, notes, (50) 755.
- Douglas fir, (41) 541.
- manufacture and sale, laws regulating, (48) 784.
- orcharding, effect on timber, (42) 241.
- production, consumption, and trade, (49) U.S.D.A. 143.
- refining, (46) 313.
- resin as a foam breaker, (41) 410.
- spruce, purification of p-cymene from, (44) 310.
- summary, (44) U.S.D.A. 207.
- thermal decomposition, (44) 806.
- value against chicken nematode, (50) Minn. 152.
- Venice, from western larch, (45) 417.

Turpentine operations—

- effects, (47) U.S.D.A. 645; (49) 238.
- notes, (43) 241.

Turtle fat, digestibility, (41) U.S.D.A. 65.

Turtle meat, canned, (47) Calif. 660.

Turtles—

- nematode parasite, (41) 753.
- of eastern United States, key, (44) 849.

Tussock grass—

- culture, (44) Alaska 328.
- sweet, notes, (43) 830.

Tussock moth—

- on Douglas fir, (41) 552.
- remedies, (42) 639.
- white-marked, control, (50) 844.
- white-marked, effect of nicotin sulphate on, (45) U.S.D.A. 151.
- white-marked, notes, (41) U.S.D.A. 462.
- white-marked, poisonous nature of, (47) 458.

Twig pruners, western, notes, (44) 256.

Twigs, feeding value, (42) 769.

Twilight, astronomical and civil, tables, (41) 808.

- Twin hybrids in *Drosophila*, (41) 867.
 Twinning in alfalfa, (41) 530.
 Twins—
 and heredity, (50) 731.
 female, from single egg cell of the ring dove, (41) 867.
 genesis, new data, (49) 567.
 identical, from large pigeon eggs, (47) 68.
 in cattle, notes, (48) 869.
 physiology of, (48) 868.
 Twist drills, use and maintenance, (45) 186.
 Twitch grass—
 production and germination, (46) 639.
 seed, production and germination, (46) 844.
 Tychius picirostris, notes, (41) 251; (50) N.Y.Cornell 57.
 Tylenchulus semipenetrans, studies, (48) 548; (49) Calif. 350.
 Tylenchus—
 angustus, notes, (42) 145; (43) 444, 652; (44) 445; (45) 48.
 angustus, studies, (41) 64.
 devastatrix—
 control, (43) 49; (45) 851.
 notes, (43) 350; (45) 446; (49) 839.
 on red clover, (43) 46.
 relation to bulbs, (50) 452.
 dipsaci—
 description, (50) U.S.D.A. 145.
 [devastatrix] on red clover, (42) 743.
 notes, (44) 747, Oreg. 839; (45) Idaho 251; (47) Idaho 751.
 occurrence, (50) 754.
 on alfalfa, (50) 747.
 on clover and strawberry, (45) 444.
 studies, (50) 447.
 mahogani n.sp., notes, (44) 347.
 musicola on banana, (45) 356.
 scandens, notes, (44) 343.
 semipenetrans, studies, (42) Calif. 842.
 spp., notes, (43) 445; (47) 846.
 sycobius n.sp., description, (44) 649.
 tritici galls on wheat, (42) 245.
 tritici, notes, (43) 751; (49) N.C. 747.
 tritici, remedies, (42) 47.
 tritici, studies, (42) 448; (44) U.S.D.A. 50.
 Tyndallmeter reading of soil dispersoids, (47) 204.
 Tyndarichoides, new genus, erection, (45) 459.
 Typha insects, ecological relations, (46) N.Y.Cornell 465.
 Typha latifolia, use as fiber plants, (44) 435.
 Typhlocyba—
 australis, notes, (48) 457.
 comes, *see* Grape leafhopper.
 rosae, *see* Empoa rosae and Rose leafhopper.
 Typhoid—
 bacilli, occurrence in swine, (45) 385.
 bacilli, viability in excrement, (46) 588.
 bacteria, duration of life in septic tank, (49) 591.
 bactericidal action of serum toward, (44) 181.
 fever, avian, (50) 82, 586.
 fever, diet used in treatment, (41) 561.
 fowl, in France, (43) 84.
 immunity, studies, (43) 473.
 immunization, oral route for, (50) 478.
 vaccine, preparation, (43) 76.
 vaccines, effect of age and temperature, (48) 177.
 Typhoid-paratyphoid bacilli in milk, effect of pasteurization, (46) 275.
 Typhoon in Philippines, U.S.D.A. (44) 416, 716.
 Typhula—
 betae, studies, (45) 146.
 hyalina, notes, (47) 547.
 Typhus fever, relation to lice, (41) 552; (48) 151.
 Typhus virus in lice, infectivity, (48) 253.
 Typocerus sinuatus as forage pest, (47) 761.
 Typophorus canellus—
 control, (43) Md. 559.
 notes, (45) 859.
 on roses, (46) N.J. 557.
 Tyramin, action on pigeon beriberi, (49) 462.
 Tyroglyphidae, nonparasitic acari of, (44) 851.
 Tyroglyphus—
 longior in stored grain, (44) 851.
 longior, notes, (48) 462.
 mycophagus, biology and control, (49) 157.
 spp., control, Calif. (47) 654, 655.
 Tyrosin—
 colorimetric estimation, (44) 113.
 determination, (45) 203.
 determination in proteins, (47) 311, 504.
 effect on starch hydrolysis, (46) 707.
 in fungi, (42) 628.
 solutions, color changes in, (45) 679.
 Tyrosinase and deamination, studies, (42) 628.
 Tyrothrix tenuis, notes, (44) 205.
 Ubi, culture directions, (45) 35.
 Udder infection—
 effect on milk, (43) 877.
 relation to cellular count of milk, (41) Mich. 578.
 streptococcic, (41) Mich. 681.
 Udder, surgical diseases of, (49) 178.
 Udo root rot and wilt, (50) 655.
 Ufra disease, notes, (45) 843.
 Ulcers in stomach of domestic animals, etiology, (49) 679.
 Ulla grass, deterioration, (43) 448.

- Ulmite, constituent of black sandstone, (48) 617.
- Ulmus pumila*, notes, (42) Calif. 838.
- Ultrafiltration apparatus, (50) 612.
- Ultrafiltration, principles, (44) 410.
- Ultramarines, analysis, notes, (42) 416.
- Ultra-violet light—
 action on bone marrow, (50) 564.
 effect on calcium in blood, (50) 260.
 effect on growth of rats on deficient diet, (49) 60, 61.
 effect on metabolism, (46) 870.
 treatment for rickets, (47) 770; (50) 669.
 use against plant diseases, (50) 345.
- Ultra-violet rays—
 absorption by atmospheric ozone, (50) 208, 315.
 effect on—
 bananas, (43) 730.
 blister rust fungus, (43) Can. 754.
 pineapples, (43) 730.
 rats deprived of vitamin A, (50) 61.
 sugar cane, (43) 730.
 tuberculosis vaccine, (47) Wis. 482.
 yeastlike fungi, (44) 16.
 for sterilization of oils, (42) 707.
 injurious effect on plants, (42) 730; (46) 224.
 sterilization of water by, (43) 479.
 use in preparation of vaccines, (44) 375.
- Ultuna Agricultural Institute, (44) 896.
- Ulva lactuca*, analyses, (47) Calif. 660.
- Uncinaria polaris*, remedies, (47) 589.
- Uncinaria* spp., in foxes, (46) 886.
- Uncinula necator*, notes, (42) 49.
- Uncinula spiralis*, notes, (45) 850.
- Underdrain for perforated-pipe filter, (44) 783.
- Underdrainage, theory of, (41) 883.
- Underdrains, efficiency studies, (45) N.C. 486.
- Underfeeding effect on ovulation and oestrous cycle in guinea pigs, (44) 173.
- Undernutrition—
 chronic, ammonia excretion in, (49) 159.
 effect on mammal ovary, (46) 567.
 in steers, (50) 670.
 physiological effect, (46) 471.
 qualitative, studies, (47) 769; (49) 562.
- Undulant fever, *see* Malta fever.
- United Farmers of Ontario, organization and development, (49) 295.
- United Grain Growers, report, (46) 894.
- United States Department of Agriculture—
 and agricultural colleges, cooperation, (43) 704.
 and experiment stations, coordination of work, (41) 610.
- United States Department of Agriculture—
 Continued.
 appropriations—
 1919-20, (41) 1.
 1920-21, (43) 101.
 1921-22, (44) 401.
 1922-23, (47) 1.
 1923-24, (48) 301.
 bureaus, *see* Bureau.
 cold storage plant, (43) 892.
 graduate courses for its personnel, (45) 407.
 graduate work in, (49) 491.
 laws relating to, (41) 99.
 list of serials received in library, (48) 694.
 motion pictures, U.S.D.A. (43) 698; (48) 97.
 notes, (45) 500; (49) 200, 499.
 organization list, U.S.D.A. (41) 197; (48) 190; (49) 492.
 program of work, (41) 198.
 report, (41) 397; (43) 298; (46) 598; (49) 395.
 Secretary Wallace's address, (45) 191.
 Weather Bureau, *see* Weather Bureau.
 work of, address, (44) 90.
 yearbook, (41) 698; (43) 496; (45) 799; (48) 297; (49) 395.
 yearbooks, index, (47) 599.
- United States—
 Food Administration, price control by, (48) 391.
 Geological Survey, Reclamation Service, *see* Reclamation Service.
 Veterans' Bureau vocational schools, agriculture in, (46) 399.
 Warehouse Act, (50) U.S.D.A. 293.
- Upo, culture directions, (45) 35.
- Urania green in tablet form, (47) 552.
- Uranium—
 acetate, fertilizing value, (42) 222.
 effect on growth of *Aspergillus*, (49) 27.
 salts, effect on nitrogen fixation, (45) 810.
- Urea—
 and urea nitrate, fertilizing value, (41) 22.
 as affected by sewage organisms, (43) 791.
 as protein substitute for lactating animals, (50) 677.
 calcium nitrate, fertilizing value, (44) 318.
 composition and action, (46) 820.
 determination, (41) 13, 14, 116, 616; (42) 11; (44) 310; (50) 204.
 effect on catalase production, (42) 258.
 feeding experiments, (48) 670, 770.
 fertilizing value, (42) 624; (44) 318; (45) 518, 519; (47) 322; (48) 721, 820; (49) 20, 623.
 formation, (47) 462.
 hygroscopicity, (47) 321.

Urea—Continued.

- in blood, (45) 382.
- in blood, methods of determination, (43) 416; (45) 415; (47) 612.
- in blood, variability, (43) 265.
- in fertilizers, determination, (45) 805.
- in milk, determination, (49) 205.
- in urine, determination, (49) 205, 806.
- manufacture from ammonia, (49) 517.
- nitrate, fertilizing value, (42) 624; (44) 318; (49) 20, 623.
- nitrogen determination in, (47) 315; (49) 717.
- replacement of feed protein by, (46) 67, 68.
- substitution for protein, (48) 375, 376.
- superphosphate, composition and action, (46) 820.
- superphosphate, fertilizing value, (45) 330.
- synthesis, (47) 726.
- synthetic, fertilizing value, (50) 424.

Urease—

- from jack beans, (43) U.S.D.A. 233.
- in Dutch seeds, (43) 802.
- in seeds of cereals, (41) 111.
- in soybeans, determination, (43) 10, 610, 802.
- studies, (41) 310.
- use in urea determination, (42) 204; (50) 204.

Uredinales—

- attacking pines, notes, (42) 248.
- collected in Trinidad, (48) 242.
- culture experiments, (48) 844.
- list, (47) U.S.D.A. 148.
- of Delaware, list, (43) 328.
- of Guatemala, (41) 135.
- of Indiana, (43) 731; (49) 145.
- of Oregon, (41) 152.
- studies, methods, and terminology, (41) 152.
- temperature of spore germination, (43) N.H. 841.

Uredineae—

- cultures, memoranda and index, (48) 844.
- new species, (43) 222; (45) 222, 822.
- physiological specialization, (41) 152.
- teleutospores, germination conditions, (49) 145.

Uredo—

- arachidis on peanuts, (43) 346.
- incomposita n.sp., description, (42) 448, 644.
- kuehnii, notes, (46) 45.
- nicotianae, notes, (50) 248.
- palmarum, notes, (47) 547.
- sp. and Puccinia spp., comparison, (43) 244.
- vitis, notes, (42) 49.

Urena spp., culture in Cuba, (44) 735.

Uric acid—

- and hippuric acid bacteria, (45) 630.
- determination, (41) 13, 414; (47) 14, 315, 765; (48) 111.

Uric acid—Continued.

- determination, effect of exposure to light, (49) 113.
- endogenous, physiology of, (41) 363.
- excretion, and yeast therapy, (48) 163.
- excretion, effect of organic acids, (49) 858.
- excretion on purin-low diet, (49) 458.
- in blood, (44) 806; (45) 382.
- in blood, variability, (43) 265.
- metabolism, studies, (49) 662.

Urine—see also Manure, liquid.

- acetone in, determination, (45) 316.
- acidity, studies, (48) 163.
- albumin determination, (43) 206.
- amino acid nitrogen in, (47) 410.
- ammonia determination in, (44) 804; (49) 806.
- ammonia nitrogen from, (43) 220.
- analysis, (41) 13, 14, 413, 414; (43) 316.
- bromin determination in, (45) 314.
- calcium determination in, (46) 417; (47) 109.
- calorimetry, modified method, (43) 264.
- carbon determination in, (43) 414.
- catalase concentration in, (41) 409.
- changes due to fatigue, (41) 860; (44) 864.
- composition, effect of muscular work, (47) 264.
- composition of growing dogs, (49) 764.
- concentration, of white race in Australia, (42) 554.
- constituents, variations in, (49) 560.
- containing lactose, glucose determination, (43) 114.
- cow, analysis, (41) 82.
- cow, nitrification, (46) 714.
- creatinin in, as affected by purgation, (43) 462.
- creatinin in, determination, (45) 316.
- cystin determination in, (48) 505.
- day and night, composition, (47) 64.
- day and night, studies, (48) 63.
- diazo reaction, (43) 368.
- earth, fertilizing value, (41) 814.
- energy value in undernutrition, (43) 264.
- Filipino, analyses, (41) 562.
- human, fertilizing value, (45) 520.
- H-ion concentration, changes in, (42) 554.
- H-ion concentration determination, (47) 716.
- inorganic phosphate determination in, (45) 508.
- magnesium determination in, (46) 417; (48) 11.
- nitrites in, test for, (43) 316.
- nitrogen determination in, (43) 316; (44) 804; (45) 611; (46) 615; (49) 111.

Urine—Continued.

- nitrogen distribution in, (47) 564; (49) 257.
- nitrogen loss in, (42) 427.
- nitrogen partition, of races in Singapore, (43) 65.
- of Chinese in Peking, composition, (49) 660.
- of goats, analyses, (45) 471.
- of pellagrins, analyses, (43) 667; (45) 668.
- phosphorus determination in, (44) 613.
- pigmentation, effect of carotinoids, (42) 257.
- potassium determination in, (46) 417.
- protein determination in, (43) 416.
- proteins, differentiation, (50) 204.
- reaction, (44) 763.
- reducing substances, colorimetric determination, (43) 414.
- removal of ammonia from, (45) 415.
- saccharin in, determination, (42) 316.
- sodium determination in, (44) 806; (45) 112; (46) 417.
- sugar determination in, (43) 416; (44) 713; (45) 111; (46) 417; (47) 315, 366.
- sugar in, after glucose injection, (49) 859.
- sugar in infants, (45) 263.
- sugar in, variation, (47) 263.
- sulphur in, determination, (47) 612.
- tryptophan in, (43) 316; (45) 312.
- urea determination in, (49) 205, 806.
- uric acid determination in, (47) 14.
- urochrome in, as affected by protein intake, (44) 169.
- vitamins in, (49) 260.
- zinc in, (42) 710, 758; (45) 64.

Urochrome—

- relation to chlorophyll, (47) 64.
- relation to protein of diet, (44) 169.

Urocystis—

- cephalae—
 - control, (50) 349.
 - development and pathogenesis, (47) Mass. 351.
 - in England, (46) 548.
 - notes, (42) 46; (43) 654; (44) Mass. 445; (48) 242.
 - on onions, (44) Oreg. 841.
 - relation to climate and culture, (46) 345.
 - studies, (42) 47.
- occulta, notes, (47) 542; (49) 840.
- sp., notes, (46) 544.
- spp., notes, (43) 445.
- tritici, control, (45) 49; (49) Ill. 343.
- tritici, life history, (49) Ill. 343.
- tritici, notes, (41) U.S.D.A. 747; (44) 152; (47) 840.

Uromyces—

- aloës, life history, (43) 156.
- appendiculatus, notes, (43) 152; (44) Va. 747; (45) 50; (46) 845; (47) 839; (48) 741; 842; (49) 841.

Uromyces—Continued.

- betæ on sugar beets, (46) 450.
- caryophyllinus, notes, (45) 851; (50) 547.
- caryophyllinus, temperature of spore germination, N.H. (43) 842; (46) 343.
- effect on photosynthesis, (44) 518.
- eleocharidis, description, (42) 643.
- limonium, notes, (46) 844.
- medicaginis, notes, (50) 447.
- on clover, biology, (46) 743.
- pisi, biology, (50) 446.
- setaria italicae, notes, (48) 145.
- spp. on Euphorbia seed, (49) 442.
- striatus, notes, (45) 842.
- trifolii, notes, (46) 449.

Urophlyctis—

- alfalfæ, biology, (49) 146.
- alfalfæ, notes, (41) 656; (44) 342, 643, 748; (50) 447.
- leproides on sugar beets, (46) 450.
- sp., notes, (47) 839.

Urticales, floral anatomy, (47) 28.

Urticaria, cause, (45) 888.

Urundi, territory and people, (48) 859.

Uspulun—

- composition and fungicidal effect, (48) 241.
- For seed disinfection, (44) 243; (47) 45; (49) 839, 841, 842.
- treatment of barley, tests, (49) 840.
- use against leaf nematodes, control, (45) 851.

Ustilaginaceae, distribution in Baltic regions, (46) 239.

Ustilaginales, list, (47) U.S.D.A. 148.

Ustilaginales of Indiana, (43) 329; (49) 145.

Ustilaginoidea sp. on rice, (43) 45.

Ustilaginoidea virens, notes, (45) 650.

Ustilago—

- agropyri, suggested name, (48) Can. 450.
- avenae, effects of soil factors, (49) 749.
- avenae, spore germination, (49) 749.
- coicis, notes, (45) 541.
- crameri, studies, (45) 48; (48) 145.
- hordei, control, (47) 542.
- levis, control, (49) Wash.Col. 241.
- maydis, notes, (43) 152; (45) 50.
- panici miliacei, notes, (47) Wash.Col. 541.
- panici miliacei, treatment, (50) 349.
- paradoxa, notes, (49) 839.
- relliana, notes, (48) 743.
- sacchari, notes, (43) 444; (44) 446; (45) 449; (46) 45, 46.
- spp., cycle of development, (50) 347.
- spp. germination, relation to H-ion concentration, (46) Mo. 344.
- spp., notes, (41) Mo. 654; (43) 445; (44) 151; (46) 239; (47) 544; (50) 548.

Ustilago—Continued.

- tritici, notes, (41) 544; (43) 751; (44) 539; (50) 144.
- violacea conjugation, and secondary sex characters, (49) 222.
- violacea, specialized forms, (45) 844.
- virens on rice, (45) 351.
- zeae, description, (42) Ohio 448.
- zeae, notes, (47) 244.
- zeae, segregation of susceptibility to, (41) 747.
- zeae, spore germination as affected by temperature, (49) 749.

Ustilina—

- vulgaris, parasitism of, (42) 51.
- zonata, host plants, (46) 455.
- zonata, notes, (42) 646; (43) 247; (47) 548, 549, 754; (48) 45; (49) 45.
- zonata on rubber, (41) 546; (45) 148.

Utah—

- College, notes, (41) 500; (43) 498; (44) 398, 798; (46) 299; (49) 198; (50) 699.
- Station, notes, (41) 500; (43) 498, 900; (44) 798; (46) 299; (48) 698; (49) 198; (50) 699.
- Station, summary of experiments, (45) Utah 698.

Uterus—

- and ovary, physiological correlation, (48) 869.
- extirpation, effect on corpus luteum, (50) 826.
- reversion of, (50) 381.

Uvaria rufa, culture, (44) P.R. 235.

Vaccination—

- and infection by tracheal route, (45) 279.
- by ingestion, (50) 478.
- by ingestion of typhoid bacilli, (43) 473.
- in the field, hints, (43) 683.
- with heated cowpox virus, (42) 176.
- with killed bacteria, (44) 876.

Vaccine—

- and serum therapy—
 - in horse diseases, (45) 385.
 - in veterinary practice, treatise, (49) 78.
 - principles, (45) 382.
- new, against contagious abortion, (43) 82.
- organisms, culture media for, (41) 680.
- organisms in, estimating number, (43) 782.
- studies, (49) 378.
- therapy, methods, comparative value, (42) 270.
- tuberculosis, therapy, (42) 380.

Vaccines—

- activation of, (44) 578.
- and lipovaccines, comparison, (47) 879.
- as new and nonofficial remedies, (41) 781; (43) 470.

Vaccines—Continued.

- bacterial, effect of age and temperature, (48) 177, 277; (50) 282.
- clinical value, treatise, (41) 283.
- commercial, value, (43) Nebr. 882, Nebr. 887; (45) 578.
- failures in use of, (45) 681.
- fat-splitting enzym in, value of, (42) 270.
- germ-free, preparation, (44) 681.
- manufacture in India, (42) 675.
- methods of standardizing, (45) 280.
- preparation, (41) 377; (43) 76; (45) 682; (50) 879.
- preparation and preservation, (42) 73.
- preparation, use of ultra-violet rays, (44) 375.
- prophylactic and curative value, (41) 576.
- prophylactic inoculation, single and fractional dosage, (48) 278.
- prophylactic, virulence of organism as factor, (47) 484.
- size of prophylactic dose, relation to protection, (50) 282.
- standardization, (43) 181.
- technique, treatise, (44) 475.
- use of chloretone for, (44) 578.

Vacuna californica n.sp., studies, (42) 155.

Vacuoles—

- metachromatin and tannic compounds in, (46) 723.
- origin in aleurone during germination, (50) 222.
- origin in root cells, (46) 823.

Vacuome in asparagus, (45) 30.

Vacuomes in plant cells, (44) 822; (45) 30.

Vacuum pan, internally heated, description, (48) 709.

Vaginal closure membrane in guinea pigs, (42) 668.

Vaginitis, granular, in cattle, (50) 882.

Vaginulus floridensis, notes, (41) Fla. 548.

Vaiole, new sumac disease in Italy, (43) 49.

Valley, mountain, transect of, (48) 641.

Valonia macrophysa, acidity of cell sap, (42) 25.

Valsa—

- chlorina, notes, (47) 547.
- leucostoma, notes, (43) Can. 847; (44) Conn.State 150; (48) 646.
- spp. on Rosaceae, (41) Ill. 157.

Valves—

- flow of water through, (42) 480.
- for tractor engines, (43) 288.
- hydraulic experiments with, (42) 79.

Van Fleet, W., plant-breeding activities, (46) 541.

Vanadium in Hagerstown soil, (49) Pa. 210, 617.

Vanessa—

- spp., absence of complement in blood (41) 754.

Vanessa—Continued.

- urticae, blood cytology, (44) 758.
- urticae, notes, (43) 853.

Vanilla—

- analysis, (43) N.Dak. 315.
- beans, curing, (42) 538; (44) P.R. 441; (48) P.R. 234.
- beans, solvents for extracting, (50) 501.
- botany, culture, and manufacture, (50) 39.
- breeding experiments, (48) P.R. 227.
- culture, (44) Hawaii 44.
- culture, aerial propagation, (44) P.R. 235.
- culture and preparation, (44) 237.
- culture experiments, (44) P.R. 441.
- culture in Porto Rico, (41) P.R. 45.
- diseases, (46) 454.
- effect of pruning and shading, (45) P.R. 638.
- extract, analyses, (47) Me. 764; (50) Conn.State 160.
- extract, lead number determination, (45) 718.
- tincture, National Formulary, method of preparation, (42) 11.
- tree, diseases and pests, (44) 238.
- value against grasshoppers, (45) 151.

Vanillin—

- coumarin in, detection, (45) 13.
- destruction by soil bacteria, (44) 127.
- determination, (43) N.Dak. 368.
- determination in vanilla, (41) 114, 799.
- in vanillin sugar, determination, (47) 611.
- oxidation products, analysis, (43) N.Dak. 314.
- oxidation to vanillic acid, (42) 425.

Vapor pressure tables, (41) 808.

Variability, genetic, (41) 867.

Variation—

- and correlation in plants, (41) 327.
- and mutation in *Epilobium*, (41) 330.
- in *Abutilon theophrasti*, (43) 433.
- in *Anemone* and *Clematis*, (42) 726.
- in chromosome number in *Oenothera*, (41) 224.
- in cotton, (45) 342.
- in *Lupinus*, (47) 822.
- in *Phaseolus*, morphological and physiological, correlation, (41) 224.
- in plants through normal diversity, (41) 522.
- in *Primula* under cultivation, (41) 635.
- in *Ranunculaceae*, (42) 725, 726.
- in red clover, (46) 438.
- inheritance in deer mice, (41) 175.
- law of homologous series in, (49) 822.
- nontransmissible tricolor, in rats, (49) 368.
- of flowers in *Anemone hepatica*, (43) 328.

Variations—

- casual, inheritance of, (43) 222.
- in apples and strawberries, (45) Mo. 136.

Variegation—

- in cultivated plants, (49) 128.
- in tree foliage, (43) 729.
- inheritance in *Chlorophytum*, (50) 23.
- studies, (43) 433.

Variety names, standardization, (42) 529.

Varnishes—

- chemistry of, progress, (41) 614.
- fatty acids obtained from, (45) N.Dak. 318.
- films, stress-strain measurements, (46) 586.
- manufacture and sale, laws regulating, (48) 784.
- tests, (49) 385.
- tests and analyses, (45) N.Dak. 318.

Vascular—

- anatomy of bamboo, new feature in, (50) 728.
- anatomy of bean seedlings, (46) 825, 826.
- bundles, types, interrelationship of number, (48) 728.
- tissue, evolution of, (44) 132.

Vaucheria, chondriome in, (45) 31.

Veal, cold storage, cooking, (44) 61.

Veal production, studies, (44) Pa. 770.

Vegetable—

- biology, elements, textbook, (46) 221.
- by-products, experiments with, (42) 137.
- canneries, inspection, (48) U.S.D.A. 60.
- containers, standard size, (44) 144.
- containers, standardizing, (41) 443.
- diseases—
 - control, (41) 56, 749.
 - in England and Wales, (49) 645.
 - seed and soil treatment for, (41) N.J. 654.
 - studies, (49) Ind. 537.
- driers, construction, (42) U.S.D.A. 114.
- extracts, analyses, (42) 162.
- galls, character and origin, (49) 45.

gardening—

- handbooks, (41) 236, 339, 538, 648.
- home, directions, (42) U.S.D.A. 341.
- home, profits, (47) Mo. 235.
- notes, (45) 134.
- on sandy soils, (41) Wis. 18.
- treatise, (42) 637; (43) 236; (50) 740.
- growths in sewage trickling filters, (46) 492.
- histology, elements, (46) 322.
- investigations at experiment stations, (46) 443.
- investigations, need for, (43) 643.
- juices, bactericidal power, (42) 7.

Vegetable—Continued.

- juices, proteins, isoelectric points, (42) 202.
- market in Philadelphia, (45) U.S.D.A. 89.
- marrow as substitute for apple, (46) 258.
- marrows, variety tests, (41) 443.
- oils, *see* Oils, vegetable.
- proteins, *see* Proteins.
- saps, electrical conductivity, studies, (42) 228.
- saps, physicochemical properties, (49) 24.
- seed production in Great Britain, (41) 737.
- seeds, home production, (44) Ohio 145.
- seeds, identification, (44) 143.
- tissues, food reserve in, (48) 625.
- waste, preparation for feeding stuffs, (43) 868.

Vegetables—

- acclimatization, (50) Alaska 539.
- analyses, (43) 63.
- and milk, relative value as calcium source, (48) 463.
- antiscorbutic value, (41) 168, 266, 562, 860.
- aphid enemies, (41) N.J. 255.
- availability of carbohydrates in, (42) 457.
- Bacillus botulinus* on, (44) 763; (49) 860, 861, 862.
- Bacillus tetani* on, (49) 863.
- biennial, for seed production, wintering, (49) Idaho 740.
- boiled, for diabetics, (42) 558.
- breeding experiments, (42) 137; (45) 734.
- British imports, (48) U.S.D.A. 536.
- canned, analysis, official method, (44) 9.
- canned, antiscorbutic and growth-promoting value, (42) 163.
- canned, bacterial flora, (46) 859.
- canned, microorganisms in, (42) 164.
- canned, spoilage in, (49) Colo. 412.
- canning, (41) Kans. 15, 668; (46) U.S.D.A. 208.
- canning—*see also* Canning.
 - cold-pack method outfits, (43) 808.
 - temperature changes, (45) U.S.D.A. 560.
- carbohydrates in, determination, (45) 717.
- cellar storage, (44) Ohio 338.
- cooked and raw, pH of, (41) 763.
- cooked, antiscorbutic value, (41) 168, 266.
- cooking, effect on food value, (41) 667.
- copper, determination in, (44) 62.
- culture, Can. (45) 833; (49) 832.

Vegetables—Continued.

- culture—
 - at high altitudes, (44) Colo. 234.
 - experiments, (41) Alaska 40, N.Mex. 147, Can. 538; (42) Guam 37; (43) N.Mex. 339, U.S.D.A. 339, Ariz. 741, Can. 741; (48) U.S.D.A. 235; (50) V.I. 540.
 - experiments in Nova Scotia, (41) 738.
 - handbook, (49) 832.
 - in California, (41) 237.
 - in Great Britain, (41) 538.
 - in Guam, (47) Guam 638.
 - in home and army gardens, (42) 38.
 - in Porto Rico, (50) 36.
 - in Queensland, (45) 44.
 - textbook, (50) 395.
 - treatise, (46) 138; (48) 443, 735.
- dehydrated, bacteria and molds in, (48) 60.
- dependable varieties, (49) Ohio 234.
- deterioration in Porto Rico, (41) P.R. 147.
- diseases, (47) Minn. 541.
- diseases and insects, (50) U.S.D.A. 834.
- diseases and pests, (45) 754; (47) Ohio 638.
- distribution and prices in Great Britain, (50) 293.
- dried and fresh, enzymes of, (41) 202.
- dried, deterioration, relation to moisture content, (45) 807.
- dried, effect of heat, (45) 807.
- dried, for army use, (41) 855.
- dried, nomenclature, (43) Calif. 716.
- dried, vitamins in, (41) 168, 266, 562.
- drying, (41) 116, 506, 557, 617, 618, 807; (42) U.S.D.A. 114, 202, 211, 616; (44) Hawaii 15; (45) 616.
- drying, preparation for, (45) 415.
- dusting, for insect control, (45) Mich. 258.
- economic values, (43) 366.
- fertilizer experiments, (43) R.I. 643; (47) N.H. 437.
- fertilizers for, in Egypt, (45) 816.
- for diabetics, (43) Conn.State 861; (46) 570.
- forcing in hotbeds, (42) 533.
- freezing temperatures, (48) U.S.D.A. 730.
- fresh and dehydrated, carbohydrates of, (42) 202.
- fresh, antiscorbutic value, (43) 263.
- from Volga region, composition, (50) 169.
- fumigated, hydrocyanic acid absorbed by, (49) U.S.D.A. 456.
- garden, early growth for transplanting, (43) Mo. 143.

Vegetables—Continued.

- garden, insect pests and diseases, (42) U.S.D.A. 341.
- gastric response to, (42) 861.
- glucose detection in, (44) 713.
- green, cooking, (46) 258.
- green, losses in cooking, (43) 458.
- green, vitamins in, value, (43) 165.
- greenhouse crops, (44) Oreg. 833.
- hardening, nature of, (43) 643.
- hardening process in, (46) Mo. 827.
- hardiness, varietal differences, (46) 838.
- home canned, spoilage in, (43) Mich. 114.
- home storage, (46) 386.
- importance in diet, (45) Conn.State 264; (47) 363; (49) 364.
- improvement, (45) 228.
- increasing production for war-time needs, (42) N.J. 835.
- indoor and outdoor culture, (48) 736.
- industrial utilization, (47) 112.
- insects affecting, (44) 653; (47) 359, West.Wash. 452; (50) 51.
- insects affecting in India, (45) 656.
- irrigation studies, (50) Can. 340.
- judging, (41) 443.
- manganese in, (47) 502.
- manure requirements, (50) R.I. 35.
- market at Kansas City, (43) U.S.D.A. 595.
- market diseases of, (43) 751.
- marketing, (41) Ill. 834.
- marketing in California, methods, (42) Calif. 637.
- monthly working calendar for, (43) 236.
- mulching experiments, (41) Nebr. 648.
- nomenclature of varieties, (46) 129.
- of Ontario, diseases of, (42) 147.
- oriental, antiscorbutic vitamin in, (49) 563.
- overcooking, relation to scurvy, (44) 466.
- pectin in, (44) 111.
- pentosan in, relation to hardiness, (46) 443.
- preparation and preservation, laboratory manual, (47) 696.
- preservation, (41) 298, 506; (44) 663.
- preservation for home use, (43) Can. 316.
- preservation in transit and storage, bibliography, (47) U.S.D.A. 830.
- production and trade, (49) 376.
- production in the United States, (48) 598.
- projects for vocational schools, (47) 235.
- receipts and unloads in Cincinnati, (43) U.S.D.A. 490.
- refrigeration, (43) 339.
- root, antiscorbutic value of juice, (41) 860.

Vegetables—Continued.

- sales, bushel weights for, (47) 393.
 - scoring exhibits in, (50) 195.
 - spoilage in transit and storage, (43) 656.
 - spraying, (41) Mich. 43.
 - standard containers for, (45) U.S.D.A. 135.
 - standard grades, determining, (47) 894.
 - storage, (41) Ill. 834; (45) 134; (48) 188.
 - storage in the home, (42) 616.
 - storage in winter, (46) Wash. 233.
 - storages and caves for, (43) 691.
 - sun dried, directions for cooking, (43) 64.
 - sun dried, vitamin in, (43) 63; (46) 359.
 - sun drying, (43) 808.
 - thrice boiled, carbohydrate in, (45) 665.
 - tissue breakdown in, (47) 248.
 - transplanting investigations, (43) Mo. 741.
 - treatment for diabetic diet, (48) 360.
 - varietal character, persistent, (41) 737.
 - varieties for Minnesota, (42) Minn. 736.
 - variety tests, (42) Minn. 835; (43) U.S.D.A. 339, Can. 741, Minn. 833; (44) Alaska 336, Minn. 336; (47) Minn. 338, Miss. 831; (50) Can. 36, Can. 440, Can. 643.
 - vitamin B in, (45) 765.
 - wholesale distribution, (48) 596.
 - wild, of Germany, (41) 742.
 - winter, nutritive value and cost, (41) 557.
 - yields, effect of cultivation, (46) 537.
- Vegetation—*see also* Flora, Plants, *etc.*
- and soil acidity, correlation, (44) 419.
 - aquatic, of English lakes, (47) 526.
 - around manure heaps, (43) 430.
 - as affected by altitude, (43) 149; (44) 17.
 - as affected by soil acidity, (43) 212.
 - at Northern Great Plains Station, effect of grazing, (49) U.S.D.A. 865.
 - broad-sclerophyll, of California, (49) 822.
 - changes in, effect of grazing, (46) 28.
 - distribution and soil reaction, (44) 419.
 - effect on soil temperature, (46) 720.
 - effect on wind, (48) 208.
 - in arid portions of South Australia, (45) 335.
 - in pastures, effect of burning, (49) 224.
 - in United States, relation to climatic conditions, (48) 429.
 - injury from poisonous gases and smoke, (46) 738.
 - native, as a criterion of site, (44) 133.
 - of Cyrenaica, notes, (42) 540.

Vegetation—Continued.

- of Delaware peninsula, (41) 244.
- of desert mountain ranges, (44) 134.
- of desert valley, (45) 335; (48) 826.
- of Great Plains, composition and density, (43) 522.
- of imperfectly drained desert valley, (41) 220.
- of Pyrenees, influence of snow on, (41) 328.
- of sand dunes, (41) 633.
- of Santa Lucia Mountains, (41) 220.
- of undrained depressions near Sacramento, (43) 224.
- recovery in area of Mt. Katmai, (42) 528.
- strand; ecology, (46) 27.
- strand, of Pacific coast, ecology, (45) 335.
- winter injury of 1916-17, (43) 326.

Vegetative—

- formations, studies, (41) 429.
- period, relation to frostless season, U.S.D.A. (41) 118, 716.

Veld-burning experiments, (44) 22.

Velvet bean—

- bacterial leaf spot, (45) 450.
- cake, analyses, (41) Can. 565.
- caterpillar, notes, (48) Fla. 251.
- feed, analyses, (41) Conn.State 176, Ind. 564, Ind. 868, N.Y.State 868; (42) Ind. 769, N.H. 769, Tex. 769, Mass. 866; (44) Hawaii 71, Mass. 670, Mass. 671, N.H. 671; (45) N.Y.State 469, 872; (47) 668.
- feed, digestibility, (50) Mass. 168.
- feed for hogs, (41) Fla. 568.
- feed for horses, (41) Mass. 274.
- meal, analyses, Vt. (43) 464; (45) 872.
- meal, effect on butter fat, (49) Fla. 875.
- meal, feeding value, (41) Ga. 39; (47) 871.
- meal, fertilizing value, (41) Ga. 39; (43) Ala.Col. 135; (45) Ala.Col. 119.
- meal for hogs, (41) Ky. 74.
- meal, nitrogen availability, (43) Ala.Col. 135.
- meal, palatability, (47) N.C. 580.
- meal, vitamin B in, (50) 367.
- proteins, amino acid deficiencies in, (47) 365.
- proteins, digestibility, (46) 163.
- proteins, nutritive value, (47) 461.

Velvet beans—

- analyses, (44) Conn.State 176.
- as cover crop, (44) Ariz. 532; (46) Guam 726.
- as green manure, (42) Guam 31; (47) Miss. 217; (48) V.I. 333.
- breeding experiments, (45) 734; (48) S.C. 629; (50) 637.
- bush, to control root knot, (47) Fla. 648.

Velvet beans—Continued.

- Chinese, globulin of, (42) 201.
 - composition, (42) Ala.Col. 801.
 - culture, (45) Miss. 126.
 - culture and use, (41) Fla. 39, Ga. 39.
 - culture experiments, (43) La. 635; (44) Va. 732; (45) Guam 34.
 - culture with corn, (48) Ga.Coastal Plain 128.
 - dihydroxyphenylalanin in, (44) 710.
 - effect of feeding to pigeons, (48) 472.
 - feeding value, (48) S.C. 69, U.S.D.A. 231, S.C. 665; (49) Miss. 465; (50) Miss. 68, S.C. 73.
 - for brood sows, (45) Guam 70.
 - for dairy cows, (41) Tex. 79.
 - for steers, (41) Ala.Col. 368; Fla. 566.
 - Georgia, analyses, (46) 108.
 - Georgia, nutritive value, (49) 668.
 - Georgia, proteins of, (43) 410.
 - improvement by selection, (46) 830.
 - in pods, digestibility and productive value, (47) Tex. 472.
 - inoculation, (41) Ga. 130.
 - planted with corn, (41) Ga. 32, Ga. 39; (48) Ga.Coastal Plain 628, S.C. 628.
 - popular account, (43) U.S.D.A. 831.
 - rotation experiments, (42) 230; (47) La. 428.
 - seed reports, (41) U.S.D.A. 442.
 - seeding experiments, (49) La. 824.
 - statistics, (42) U.S.D.A. 731.
 - v. cottonseed meal, (49) Miss. 471.
 - varieties, (41) Fla. 39, Ga. 39; (47) Ark. 732.
 - varieties, behavior, (48) Guam 228.
 - variety tests, (43) U.S.D.A. 330, Ariz. 733; (45) La. 223; (48) S.C. 629; (49) Guam 426, La. 824.
 - whole pressed, analyses, Tex. (42) 769; (45) 68.
- Venomous animals and venoms, treatise, (47) 846.
- "Vent gleet," etiology, (44) 881.
- Ventilating ducts, efficiency, (47) 793.
- Ventilation—
- of dairy barns, (44) 887; (45) Wis. 84; (46) 99, 587.
 - of farm buildings, (43) 892; (48) 199, 685; (50) 689.
 - of hog houses, effect on temperature, (45) 394.
 - of hog houses, heat in, (44) 888.
 - of potato warehouses, (47) Mich. 892.
 - stable, design of outtake flues, (46) 491.
 - systems, farm building, design and operation, (48) 488, 489.
 - treatise, (49) 591.
- Ventilators, roof, comparative tests, (48) 786.
- Venturi flume, description and formula, (45) Colo. 287.

Venturia—

- cucumerina n.sp., description, (47) 543.
- inaequalis—
 - control, (47) 355.
 - discharge of ascospores, (44) 848.
 - germination of conidia, (48) N.H. 544.
 - notes, (43) 155; (45) 849; (46) 243; (48) Mass. 643.
- pomi, notes, (42) 645; (43) 246; (46) 543; (50) 353.
- spp., notes, (44) 346; (47) 242, 650.

Verbena bud moth, notes, (44) 352.

Vermicularia—

- capsici, control, (44) 445, 446; (45) 48.
- capsici, notes, (43) 444; (45) 843.
- circinans, studies, (41) Ill. 246; (50) 143.
- varians, notes, (48) 242, 348.
- zingibereae, suggested name, (49) 147.

Vermiform appendix, remnant of retrograding cecum, (42) 179.

Vermifuges—

- for poultry, (43) Okla. 79.
- tests, (45) Okla. 478.

Vermont—

- Station, notes, (41) 500, 900; (44) 98; (48) 797.
- Station, report, (43) 197.
- University, notes, (41) 100, 199, 300, 500, 900; (42) 94, 499; (43) 200, 499; (44) 98, 599, 899; (45) 98.

Veronica—

- cuttings, propagation in acid medium, (49) 836.
- peronospora on, (43) 248.

Veronicella occidentalis—

- in Porto Rico, (47) 163.
- notes, (45) V.I. 150.
- on cotton, (41) 455.

Vertebrae, fused, numerical significance, (47) 865.

Vertebrates except birds in Michigan, key, (48) 249.

Verticilliose in cucumber, (41) 450, 843.

Verticillium—

- alboatrum, notes, (43) 547; (44) 447; (45) 354, 846; (46) 544; (48) N.J. 347; (49) 647, 839; (50) 248, 449, 547, 655.
- alboatrum, temperature relations, (42) 845.
- lycopersici, inoculation experiments, (45) 249.
- sp., notes, (44) 842; (45) 447, 649, 653; (47) Pa. 444; (50) 751.
- spp., notes, (46) 447.
- strains, thermal behavior, (42) 845.

Vesicular dermatitis of chickens, (45) Colo. 78.

Vespa—

- crabro, *see* Hornet, European.
- maculata, mouth parts, studies, (46) 560.

Vespidæ—

- nests and community life, (45) 762.
- species, descriptions, (42) 550.

Vesta phosphate v. superphosphate, (42) 22.

Vetch—

- and rye as fall forage, (43) Mo. 736.
- as affected by ammonium sulphate and sodium nitrate, (41) 815.
- as affected by inoculation, (49) Ariz. 620.
- as cover crop, (41) Del. 145; (45) Wash. 236; (49) Oreg. 534.
- as green manure, (41) Del. 136; (42) Va. 427, Calif. 830.
- as hay crop, (48) N.Dak. 226.
- bacteria inoculating alfalfa, (41) Ga. 130.
- behavior and adaptation, (49) Fla. 824.
- breeding experiments, (49) Oreg. 525.
- corn earworm on, control, (45) U.S.D.A. 360.
- cross-inoculation tests, (41) 523.
- culture experiments, (41) Alaska 31, 333, Can. 528; (44) Alaska 328, Alaska 522, Oreg. 826, (45) Kans. 33; (46) 436; (49) Alaska 426, Mont. 430, Oreg. 525.
- culture in British Columbia, (42) 733.
- culture on sandy soils, (41) Wis. 18.
- description and agricultural value, (43) 528.
- effect on following crop, (49) Oreg. 526.
- fall planting, (43) Wash. 738.
- fertilizer experiments, (43) N.C. 424.
- hairy, as orchard cover crop, (43) Pa. 538.
- hairy, culture, (48) Mich. 35.
- hairy, early growth in alkali soil, (42) Utah 28.
- hairy, notes, (47) Miss. 428.
- hairy, seed production, (43) U.S.D.A. 831.
- heredity and selection in, (45) 524.
- Hungarian, culture in Oregon, (49) 530.
- Hungarian, summary, (49) U.S.D.A. 828.
- in silage crop mixtures, (41) 676, 732.
- inoculation, (48) Wash.Col. 832.
- leaf spot, control, (44) Ala.Col. 744.
- liming experiments, (45) Miss. 126.
- loss of foliage, effect on disease resistance, (47) 45.
- marbled variety, production, (50) 228.
- mildew, downy, notes, (45) N.C. 443.
- narrow leaf, value, (49) N.C. 733.
- natural inoculation, (45) Colo. 213.
- place in fall cropping, (49) West. Wash. 898.
- poisonous to livestock, Wyo. (42) 879; (45) 479.

Vetch—Continued.

- purple, history and seed production, (48) U.S.D.A. 734.
- purple, yields, (44) Wash. 225.
- rotation experiments, (47) Miss. 216.
- seed, hairy, testing, (46) 732.
- seed, wild, feeding value, (43) 373.
- seeding experiments, (49) Oreg. 525, U.S.D.A. 828.
- toxic limit of alkali for, (49) 513.
- varieties, (46) Mich. 633.
- variety tests, (42) Ala.Col. 822; (43) Can. 735; (44) Oreg. 826; (45) Can. 822; (49) Oreg. 525.

Vetches, analyses, (50) Oreg. 7.

Veterinarian in Philippines, outlook, (41) 474.

Veterinary—see also Animal diseases.

- bacteriology, treatise, (48) 773.
 - education and research in South Africa, (43) 683.
 - education in Dutch East Indies, (43) 795.
 - education in India, (42) 90; (45) 495.
 - education in South Africa, (44) 295.
 - education, raising standards in, (42) 598.
 - high school in Dorpat, destiny of, (42) 494.
 - hygiene, treatise, (46) 178, 773; (49) 278.
 - instruction in Dutch East Indies, (43) 296.
 - laws in Maryland, (41) 81.
 - manual, Bengal, (42) 174.
 - medicine, diagnosis, handbook, (44) 373.
 - medicine, progress in, (45) 680; (50) 76.
 - medicine, textbook, (43) 797, 879.
 - medicine, treatise, (42) 674; (43) 683; (48) 378; (50) 180.
 - obstetrics, treatise, (46) 178.
 - ophthalmology, textbook, (50) 379.
 - physiology, essentials, treatise, (46) 681.
 - practice, vaccine and serum therapy in, (49) 78.
 - science instruction in Argentina, (42) 294.
 - science, principles of, (43) 76.
 - secrets, rural, treatise, (46) 880.
 - service in the war, treatise, (46) 479.
 - specimens, preparation and shipment, (43) 683; (44) Kans. 373.
 - studies for agricultural students, treatise, (50) 76.
 - surgeons, register, (46) 773.
 - surgery and obstetrics, (42) 879.
 - therapeutics, treatise, (48) 774.
- Vibrio fetus, etiological rôle, (45) 180.
- Vibrio fetus n.sp., studies, (41) 779.
- Vibron septique—
- antitoxins, standardization, (45) 781.
 - notes, (41) 577, 877; (44) 373.

Vibron septique—Continued.

- pathogenicity, relation to calcium ions, (41) 83.
- serological groupings, (43) 581.
- studies, (41) 476.

Viburnum americanum as garden fruit, (50) 836.

Vicia—

- cracca as silage crop, (50) Alaska 532.
- cracca, culture, (44) Alaska 329.
- fabia, proliferation of cells, (44) 28.
- hirsuta, distinguishing characteristics, (50) 439.

"Victoria," new disinfectant, (41) 189.

Vicuña, domestication in Peru, (41) 869.

Vicuña, hair structure, (44) 467.

Village, English, treatise, (48) 892.

Village life in England, (49) 694.

Villages, organization, (41) 491.

Vinasse, use as fertilizer, (45) 818.

Vine moth, treatment for, (45) 555.

Vinegar—

- analyses, (47) Me. 764.
- analysis, official method, (44) 9.
- cider, making, (44) 714; (45) Mich. 807.
- composition as affected by vinegar cels, (44) 117.
- detection of mineral acids in, (47) 109.
- dried grains, analyses, (42) 263, 560, Mass. 866; (44) Mass. 671.
- from wine, treatise, (41) 618.
- home production, (43) Mich. 698; (44) Mich. 195; (50) Iowa 113.
- inspection, (47) Conn.State 559.
- inspection and analysis, (45) Conn. State 365.
- manufacture, (41) 414.
- manufacture from Minnesota apples, (42) Minn. 316.
- manufacture from pears, Calif. (47) 614; (49) 206.
- manufacture from pineapple, (44) Hawaii 16.
- methods of investigation and standards, (41) 558.
- orange, production, (44) 615, 616.
- polarization, (47) 313.
- studies, (45) Colo. 209, Mich. 209; (47) 808.
- treatise, (43) Mich. 115.

Vines—

- culture in California, (49) 438.
- for Nebraska, list, (43) 240.
- for Yuma region, (43) U.S.D.A. 339.
- ornamental, for Minnesota, (42) Minn. 834.
- resistance to cold, (43) 438.

Vineyard—

- soils, effect of leaching, (48) Calif. 515.

surveys, technical guide, (41) 292.

Vineyards—see also Grapes.

- birds of, (41) 59.
- cultivating machinery, tests, (41) 887, 888.

Vineyards—Continued.

- fertilization, (47) 214, 320.
- frost protection by artificial clouds, (49) 615.
- grafted on American stock in Africa, (44) 43.
- home, pruning and spraying, (41) Tenn. 444.
- laying out, (48) Calif. 445.
- phylloxera-infested, (44) Calif. 654.
- phylloxera-infested, reconstitution, (41) 241.
- trellises and supports for, (48) Calif. 238.
- war devastated, reconstruction, (43) 835.

Vinquish, effect of nutrition, (50) 266.

Vinsonia stellifera, notes, (43) 555.

Violet—

- gall midge, studies, (47) Conn.State 155.
- leaf spot, notes, (45) 851.
- root rot, studies, (48) 456.
- soft rot, cause, (49) 651.

Violets—

- asexual inheritance in, (44) N.Y.State 339.
- culture, treatise, (44) 45.
- of North America, (47) Vt. 526.
- Perrisia affinis on, (43) 661.

Virgin Islands Station, report, (44) 394; (45) 198; (48) 396; (50) 598.

Virginia—

- College, notes, (41) 900; (42) 696; (43) 499; (48) 699; (49) 900.
- colonial, history of, (48) 790.
- creeper fruit, composition, (41) 710.
- Station, notes, (41) 399, 900; (42) 696; (43) 499; (44) 98, 497; (46) 397, 797; (47) 198, 400, 600; (49) 300 900; (50) 398.
- Station, report, (42) 496; (44) 795.
- Truck Station, index to Bulletins 1-25, (43) 98.
- Truck Station, notes, (41) 500; (42) 798; (43) 200, 600; (44) 497; (45) 98, 700; (47) 700; (48) 299; (49) 199.

Virus—

- adsorption by normal euglobulin, (42) 475.
- cowpox, heated, vaccination with, (42) 177.
- diseases of plants, (50) 244.
- filterable, nature of, (47) 181.

Viruses—

- filterable, (50) 78.
- filterable and ultravisible, (46) 81.
- ultramicroscopic, nature, (48) 675.

Viscometer, description, (49) 110.

Viscosity—

- as measure of hydration capacity of flour, (50) 503.
- of protoplasm, (50) 525.

Viscum on Casuarina, (46) 343.

Vitamin A—

- administered parenterally, action, (49) 666.
- and action of light, relationship, (49) 60, 61.
- and antirachitic vitamin, differentiation, (46) 165; (50) 858.
- and C deficient diet, effect on guinea pig, (46) 567.
- and calcium deficient diet, effect, (47) 567.
- and carotinoids, (45) 867.
- and cod liver oil, (48) 467.
- and fat-free diet, (46) 256.
- and phosphorus deficient diet, effect, (46) 472, 473.
- and xerophthalmia, relation, (45) 669; (46) 760.
- and yellow pigments, relation, (45) Wis. 271, 563; (47) 464, Wis. 464.
- association with lipochromes of plant tissues, (49) 768.
- chemistry of, (50) Minn. 163, 801.
- deficiency—
 - and ophthalmia, (50) 60.
 - cause of nasal sinus infection, (50) 263.
 - changes in paraocular glands, (50) 464.
 - effect on growth, (48) 863.
 - effect on reproduction, (50) 60, 163.
 - in animal feeds, (47) Iowa 69.
 - in poultry, (50) 871.
 - ocular manifestations, (48) 863; (50) 463.
 - of mangels, (49) 262.
- deficient diet—
 - effect on blood platelets, (49) 61, 562.
 - effect on eyes, (45) 570.
 - effect on rats, (45) 565; (48) 260.
 - effect on young, (47) 365.
 - effects, (45) 865; (46) 472, 473; (50) 263.
 - ophthalmic reaction from, (46) 469.
- distribution in whole milk and skim milk, (49) Wis. 664.
- effect of heat and aeration, (45) 563, 564.
- effect of ozone, (45) 564.
- effect on calcium assimilation, (47) Wis. 479.
- extractability of, (43) 367.
- extraction from fresh vegetables, (44) 261.
- feeding tests, technique, (44) 764.
- in artichokes, changes in, (50) 462.
- in butter, (45) 564; (46) 357, 680; (47) 862.
- in carrot seed, (46) 357.
- in carrots, tests, (48) 656.
- in citrus fruits, (46) 567; (50) 59.

Vitamin A—Continued.

- in coconut oil, (47) 661.
- in cod liver oil, (45) 564; (47) 365, 768, 862; (48) 862; (49) 461.
- in cod liver oil as affected by preparation, (48) 64.
- in cod liver oil, inactivation, (47) 565.
- in diet, effect of quantity on calcification of bones, (50) 264.
- in dried orange juice, (47) 465.
- in fats, relation to nutritive value, (46) 256.
- in fats, relation to yellow pigments, (46) 61.
- in fish liver oils, (46) 567; (47) 768, 769; (50) 664, 665, 858.
- in food, estimation, (46) 806.
- in lard, (45) 566.
- in lard and cottonseed oil, (43) 764.
- in lard from hogs on control ration, (49) 59.
- in linseed oil, (50) 163.
- in marine animals and plants, (47) 661.
- in milk, (46) 357, 680; (47) Wis. 464; (48) 862; (50) 567.
- in milk, effect of diet of cow, (47) 78.
- in milk, increasing, (49) 780.
- in millets, (50) 364.
- in nutrition of fish, significance, (48) 864.
- in nuts, (44) 765.
- in oils, (45) 62.
- in oils, color reaction for, (48) 759.
- in palm kernel oil, (46) 256.
- in pea seed, (46) 357.
- in peas, relation to yellow pigments, (46) 257.
- in plant tissues, (43) 165; (46) 356; (49) 767.
- in rat liver, storage, (49) 260.
- in skim milk, (50) 59.
- in vegetable oils and fats, (49) 59.
- in walnuts, (50) 462.
- mode of action, (50) 858.
- production in plants, relation to photosynthesis, (47) 368.
- quantitative study, (48) 656.
- relation to lipochromes, (44) 764.
- relation to rickets, (43) 664; (47) 270; (49) Wis. 664.
- relation to rickets and growth in pigs, (46) 64; (48) 73.
- relation to technical fat chemistry, (43) 860.
- relation to xerophthalmia, (43) 860.
- requirement for reproduction and lactation, (47) 862.
- requirement of animals, (47) 169.
- requirement of growing chicks, (49) 673.
- requirement of pigs, (49) Ill. 369.
- solubility in ether, (44) 262.
- storage, (50) 60, 363.
- storage and synthesis, (50) 666.
- studies, (45) 366.
- synthesis by marine diatoms, (47) 769.

Vitamin, antiberiberi—

- discussion, (46) 864
- rôle in carbohydrate metabolism, (42) 557.

Vitamin, antineuritic—

- and water-soluble, differentiation, (42) 460.
- in infant feeding, rôle of, (42) 256.
- in urine, (49) 260.
- in wheat and corn, (41) 466.
- isolation, (48) 611.
- lack as affecting organs and tissues, (41) 265.
- nature and function, (42) 865.
- new term for, (43) 861.
- relation to phosphoric acid in maize products, (42) 256.
- relation to secretin, (44) 766.
- studies, (41) 765, 766.
- synthesis by intestinal flora, (48) 363.

Vitamin, antirachitic—

- and vitamin A, differentiation, (46) 165; (50) 858.
- deficiency, pathologic effects, (50) 263.

Vitamin B—

- action of dry and moist heat, (50) 858.
- administered parenterally, action on growth, (49) 666.
- and antineuritic vitamin, differentiation, (44), 170; (50) 770.
- and beriberi, (47) 168.
- and C, differential dialysis, (46) 11.
- and coenzymes, (46) 866.
- and D, comparison, (48) 559.
- and pigeon beriberi, (47) 862.
- and secretin, differentiation, (45) 366, 665; (46) 761.
- and water-soluble biocatalyzers, (48) 657.
- and yeast vitamin bios, relation, (49) 856.
- chemical nature, (50) Minn. 163.
- color test for, (50) 506.
- concentrates, listing, (47) 266.
- concentrating from wheat bran, (49) 160.
- deficiency—
 - effect on lymphocytes, (46) 867.
 - effect on metabolism, (49) 857.
 - effect on sex glands, (49) 562.
 - in rats, (47) 769.
 - relation to bacterial infection, (50) 770.
 - rôle of suprarenals in, (50) 859.
- deficient diet, relation to pneumococcal infection, (47) 368.
- deficient diets, metabolism studies, (44) 861.
- deprivation and fasting, effect on rats, (46) 62.
- detection, (49) 562.
- determination, yeast method, (44) 260, 561, 861; (45) 765; (46) 164; (49) 857.

Vitamin B—Continued.

- determinations, use of rats for, (49) 665.
- distribution, (48) 64.
- effect of alkali on, (45) 410.
- effect on—
 - appetite, (46) 868.
 - cellular metabolism, (48) 557.
 - egg production, (50) Pa. 473.
 - growth of organs in cockerels. (49) 569.
 - growth of *Staphylococcus aureus*, (46) 80.
 - nutrition, (44) 860.
 - secretory glands, (46) 760.
- for rats, daily requirement, (49) 62.
- from *Azotobacter*, (49) 365.
- from bacteria, (50) 664.
- function, (47) 859.
- in artichokes, changes in, (50) 462.
- in celery, (47) 267.
- in chlorophyll-free plants, (48) 162.
- in edible animal tissues, (49) U.S.D.A. 63.
- in eggs, (49) 161.
- in fruits, (43) 765.
- in milk, (43) 165; (45) 567; (47) Wis. 464, 861.
- in milk, effect of diet of cow, (47) 78; (49) Wis. 666.
- in orange juice, (43) 460.
- in rice, (47) 62.
- in rice polishings, (46) 204; (49) 857.
- in skim milk powder, (46) 61.
- in vegetables, (45) 765; (47) 267.
- in vegetables, effect of cooking, (44) 562.
- in velvet bean meal, (50) 367.
- in wheat kernel, (47) 860.
- in yeast, (46) 204; (49) 562; (50) 768.
- in yeast, differentiation from co-enzym, (46) 309.
- in yeast, effect on growth, (48) 759, 760.
- in yeast, effect on plant cell masses, (45) 465.
- isolation, (46) 864.
- parenteral administration, (50) 465.
- plant sources, (46) 667; (47) 465.
- relation to nutrition, (46) 358.
- relation to yeast growth, (47) 266.
- relative values in yeast and wheat embryo, (50) Minn. 163.
- requirement of rats, (47) 365.
- rôle of metabolism, (48) 558.
- significance in carbohydrate metabolism, (49) 359.
- solvent for, (48) 12.
- starvation, basal metabolism in, (50) 63.
- storage by rats, (49) 665.
- studies, (46) 760.
- studies with pigeons, (50) 264.
- synthesis by yeast, (45) 765; (46) 61; (48) 760.

Vitamin B—Continued.

- synthesis. tests, (46) 760.
- therapeutic possibilities, (46) 868.
- usefulness in insulin cure, (50) 864.

Vitamin C—

- as affected by heat, (43) 567.
- chemistry of, (49) Wis. 610.
- deficient diet—
 - effect on bones and teeth, (48) 465.
 - effects, (45) 65.
 - scurvy production by, (50) 166.
- destruction, (46) 865.
- destruction as affected by temperature and pH, (46) 667.
- destruction by heat, (49) 563.
- destruction rate, (45) 563.
- detecting, (49) 805.
- effect of heat and oxidation, (46) 469.
- effect of heating with invertase, (46) 761.
- effect of oxidation, (45) 466.
- extracts, color reaction, (46) 668.
- growth-promoting properties, (48) 761.
- in apples and bananas, (45) 466.
- in beef, raw, (43) 664.
- in body tissues of rat, (44) 862.
- in cabbage, effect of cooking, (47) 466.
- in cabbage, sun-dried, (43) 63.
- in carrots, sun-dried, (43) 63.
- in dried fruits, (47) 62.
- in dried orange juice, stability of, (43) 460.
- in fats, investigations, (49) 58.
- in feeding stuffs, (47) Wis. 464.
- in fruit juices, (43) 263, 667.
- in fruits, (47) 62, 268.
- in goat's milk, (49) Ohio 259.
- in honey, (44) 63.
- in lemon juice—
 - desiccated, (46) 359.
 - effect of reaction on oxidation, (49) 806.
 - effect of sterilization, (46) 761.
 - stability, (46) 475.
 - sterilized, (49) 365.
- in meat juice, (43) 263.
- in milk, (43) 166.
- in milk and orange juice, combined action, (47) 61.
- in milk as affected by diet, (42) 766.
- in milk, destruction by alkalization, (42) 256.
- in milk, effect of spray process of drying, (50) 564.
- in milk powders, (45) 767.
- in onions, sun-dried, (43) 63.
- in orange juice, solubility, (47) 805.
- in oriental fruits and vegetables, (49) 563.
- in oysters, (50) 465.
- in potatoes, raw and dried, (43) 765.
- in tomatoes as affected by heat and age, (45) 365.
- in urine, (49) 260.

Vitamin C—Continued.

- introduced parenterally, passage into milk, (49) 666.
- introduced parenterally, utilization by organism, (49) 666.
- occurrence and properties, (50) 859.
- plant sources, (46) 667; (47) 465.
- preparations, concentrated, conservation of potency, (49) 806.
- relation to bacterial infection, (49) 461.
- requirements of growing chicks, (49) 673.
- requirements of monkeys, (43) 461.
- requirements of prairie dog, (44) 863.
- stability, (45) 766.
- studies, (46) 865.

Vitamin D—

- and B, comparison, (48) 559.
- designation, (49) Ohio 259.
- growth stimulant for yeast, (46) 759.
- in sugar cane, (50) 564.
- studies, (48) 560; (49) 261; (50) 363.

Vitamin—

deficiency—

- and exposure to X-rays, similar effects, (46) 62.
- and nitrogen equilibrium, (45) 567.
- disease in pigeons, pathogenesis, (42) 166.
- effect on adrenals, (50) 668.
- effect on animals, (43) 369.
- effect on blood, (49) 565.
- effect on digestive enzymes, (49) 161.
- effect on opsonic activity of sera, (48) 863.
- effect on oxygen consumption, (49) 767.
- in the diet, (50) 565.
- relation to disease, (45) 165.
- deficient tissues, respiration in, (47) 860.
- doctrine and oleomargarin industry, (46) 256.
- extraction from rice bran, (44) 171.
- fat-soluble—
 - absence in ductless glands, (41) 670.
 - associated with yellow pigment in corn, (42) 461.
 - clinical rôle, (42) 461.
 - deficiency, cause of calculi, (42) 462.
 - distribution in foods, (41) 670
 - in coconut oil, (41) 363.
 - in green plants, (42) 556.
 - in hardened fats, (41) 362
 - in roots, (42) 460.
 - relation to carotinoids, (42) 257.
 - relation to formation of teeth, (41) 365, 858.
 - relation to rickets, (41) 364, 365.
 - relation to yellow plant pigment, (42) 257, 556.

Vitamin—Continued.

- fat-soluble—continued.
 - studies, (41) 559.
 - thermostability, (42) 556.
 - food tablets, use, (46) 356.
 - hypothesis in relation to stock feeding, (48) 368.
 - index, formula, (42) 366.
 - number defined, (43) 614.
 - preparations—
 - activity, test, (48) 12.
 - commercial, potency, (47) 860; (48) Conn.State 261.
 - tests, (49) 259.
 - therapeutic use, (47) 266.
 - products, proprietary, value, (47) 368.
 - promoting calcium deposition, studies, (48) 563.
 - requirements—
 - effect of exercise, (50) 464.
 - of animals, (50) 266.
 - of bacteria, (46) 759.
 - of chicks, (50) 373.
 - of cows, (50) Minn. 175.
 - of Drosophila, (47) 565.
 - of fish, (49) 565.
 - of frogs, (43) 462.
 - of pigs, (47) Iowa 777.
 - of plants, (45) 28.
 - of poultry, (48) 272.
 - of rats on various diets, (44) 465.
 - of yeast, (41) 670; (42) 58.
 - research, present status, (50) 856.
 - rich diet, effect on backward children, (46) 868.
 - silver compound from yeast, (45) 612.
 - starvation, effect on poultry, (47) N.Y. State 577.
 - starvation, metabolism and respiratory exchange in, (47) N.Y.State 465.
 - theory in rickets, (47) 271.
 - water-soluble—
 - distribution, (41) 762; (42) 759
 - extraction from brewers' yeast, (42) 314.
 - identity with secretin, (41) 267.
 - in green plants, (42) 556.
 - of wheat, (41) 262.
 - removing from proteins, (41) 761.
 - studies, (41) 671.
- Vitamin-activated fuller's earth, preparation, (47) 408.
- Vitamin-free diet, preparation, (42) 365.
- Vitamins—
- absolute requirements and body reserve, (42) 366.
 - action on *Oidium lactis*, (41) 558.
 - addition to lipid-free diet, (42) 257.
 - adsorption of, (47) 663.
 - and artificial nutrition, treatise, (45) 464.
 - and bacterial growth, (50) 769.
 - and choice of food, treatise, (48) 162.
 - and cod liver oil, (46) 256.
 - and court-noué, (48) 147.
 - and diet, (46) Ark. 667.

Vitamins—Continued.

- and iron metabolism, (49) 564.
- and lipid metabolism, (44) 466.
- and manganese, association, (50) 463.
- and nutrition, (46) 256, 257.
- and nutrition, treatise, (47) 768.
- and oleomargarin manufacture, (47) 662.
- and rickets, review of literature, (46) 257.
- and spasmophilia, (44) 63.
- antineuritic and antiscorbutic, coexistence of, (43) 461.
- as complementary factors to diastatic action, (42) 460.
- biological action of, (44) 561.
- chemical isolation of, (43) 459.
- chemical nature of, (46) 864.
- chemistry of, (45) 311; (47) 663.
- conditions of inactivation, (47) 565.
- definition, (42) 758.
- determination, (43) 614; (44) 561.
- discussion, (44) 62.
- effect of—
 - aeration, (45) 565.
 - cooking, (45) 666.
 - deprivation of, (42) 166.
 - heat, (46) 360.
 - ultra-violet rays, (42) 59.
- effect on—
 - calcium metabolism, (49) 58.
 - course of pellagra, (43) 667.
 - enzym activity, (47) 664.
 - growth of pigs, (46) Iowa 362.
 - metabolism in paramecium, (42) 662.
 - metabolism in *Sclerotinia cinerea*, (42) 433, 758.
 - organs of pigeons, (45) 467.
- essential for life, (42) 257.
- exposure to radium, (48) 759.
- extracting and concentrating, (46) 11.
- extraction from yeast, (50) 506.
- function in metabolism, (49) 364; (50) 565.
- health, and daily diet, (49) Ark. 364.
- immunologic significance, (49) 279.
- importance in animal feeding, (45) 373.
- importance in immunity, (48) 774.
- importance in livestock feeding, (49) 256.
- importance in pig feeding, (49) 672.
- in animal tissue, effect on pathogenic bacteria, (41) 574.
- in canned foods, (47) 768.
- in cod liver oil, (47) 365, 465, 565, 768, 769, 862.
- in dairy ration, effect on milk, (47) 281.
- in diet, effect on calcium metabolism, (48) 756.
- in eggs, relation to feed, (46) Kans. 478.
- in feeding stuffs, (47) 464.
- in fish meal, tankage, and blood meal, (50) 573.

Vitamins—Continued.

- in flour, (46) 470.
- in foods, (42) 463; (44) 667; (48) 12; (49) 364.
- in foods, effect of processes, (46) 257.
- in foods, factors affecting, (46) 864.
- in fruit, relation to disease, (44) Minn. 746.
- in grain as affected by soil fertility, (46) 624.
- in honey, (45) 365, 665.
- in human nutrition, (42) Ohio 460; (49) 762.
- in ice cream, (49) 59.
- in Indian foods, (47) 661.
- in infant feeding, (49) 856.
- in microorganisms, relation to culture medium, (47) 167.
- in milk, (45) 867; (48) 259; (50) 175, 857.
- in milk—
 - after electrical treatment, (42) 875.
 - and milk products, (46) 60, 61, 357, 680.
 - effect of autoclaving, (50) 62.
 - effect of formaldehyde, (49) 459.
 - papers on, (49) 176.
 - variation, (49) Ohio 376.
- in mushrooms, (50) 857.
- in nutrition of the rat, (41) 171.
- in oil, effect of hydrogenation, (46) 565.
- in oleomargarin, (46) 256.
- in palm kernel meal, (50) 64.
- in plant tissue, effect on bacterial growth, (46) 866.
- in plants, development, (50) 769.
- in plants, distribution, (45) 562.
- in raisins, (50) Pa. 463.
- in sun-dried vegetables, (43) 63; (46) 359.
- in vegetables, (48) 826.
- in war-time diet, (42) 552.
- in wheat bran, (46) 256.
- in yeast, action of radium emanation on, (42) 167.
- inorganic substances as substitutes for, (50) 564.
- lack in experimental rations, effects, (41) 670.
- literature of, diversities, (44) 62.
- manual, (46) 256.
- mode of action, (50) 665.
- nature and function, (49) 663.
- nature and significance, (43) 367, 860.
- nomenclature, (44) 764.
- papers on, (47) 662.
- physiological significance, (46) 469.
- physiology, (50) 465.
- position in clinical medicine, (44) 361.
- practical importance, (41) 558.
- present knowledge, (43) 262; (48) 466.
- production, rôle of microorganisms in, (46) 866; (48) 760.

Vitamins—Continued.

relation to—

- diseases, (41) 671.
- health, (46) 62.
- health and disease, (49) 159.
- immunity production, (41) 574.
- livestock feeding, (47) Iowa 69.
- poultry diseases, (50) N.J. 383.
- streptococcus growth, (48) 657.
- teeth and bones, (45) 61, 466.
- yeast growth-promoting stimulus, (44) 171.

review of literature, (41) 558; (44) 860; (45) 562.

rôle in—

- assimilation of food, (49) 159.
- bacterial growth, (46) 80; (49) 460.
- cell chemistry, (47) 168, 860.
- chick feeding, (43) 174.
- infant feeding, (43) 166.
- iron assimilation, (49) 564.
- nutrition of tadpoles, (41) 468.
- pig feeding, (45) 875.
- tropical diseases, (49) 160.
- yeast growth, (45) 565.
- significance, (47) 466.
- sources and function, (49) Ohio 259.
- sources, review of literature, (47) 265.
- stability, (50) 664.
- studies, (42) 58; (43) 262, 263, 664, 861; (44) 559, 560, 561, 562; (45) 108, 165, 264, 663, 867; (46) 271; (49) 64; (50) Minn. 163.
- studies at experiment stations, (46) 603.
- studies, methods, (46) 864; (48) 259.
- studies, new viewpoints, (48) 261.
- studies, practical application, (48) 63.
- studies with rabbits and chickens, (47) Iowa 772.
- summary, (41) 762; (44) 262; (47) 768; (48) 360.
- symposium on, (45) 365.
- synthesis in intestines of rabbits, (43) 166.
- theory of action, (47) 265.
- treatise, (45) 562; (46) 863; (47) 62; (48) 162.

Vitula serratilineella feeding on honey, (43) 558; (48) 459.

Vivipary in grasses, (45) 123.

Vocational education—

- agricultural, *see* Agricultural education, vocational.
- and general science, (43) 396.
- bibliography of Farmers' Bulletins for use in, (41) 298.
- elementary, for Colorado, (43) 396.
- Federal Board for, history and activities, (47) 694.
- for girls, (43) 197.
- for girls and women, (45) 94.
- home economics, in Tennessee, (42) 396.

Vocational education—Continued.

- home economics, need for training, (42) 292.
- homemaking, (45) 496; (46) 296.
- in Alabama, (43) 296; (44) 897.
- in Arizona, (41) 392, 595.
- in California, (42) 192, 692.
- in China, (49) 796.
- in Colorado, (41) 296, 392; (43) 297.
- in Florida, (43) 595.
- in Georgia, (41) 392, 494; (43) 297.
- in Idaho, (41) 297; (45) 197.
- in Illinois, (42) 294.
- in Indiana, (43) 195, 695; (44) 794.
- in Indiana, 1920–21, plans for, (44) 295.
- in Iowa, (41) 297; (42) 295.
- in Kansas, (41) 297; (42) 494.
- in Kentucky, (42) 193; (43) 695.
- in Louisiana, (42) 596.
- in Maine, (43) 696.
- in Maryland, (42) 596.
- in Massachusetts, (41) 297, 393; (42) 394; (43) 194; (46) 696.
- in Michigan, (41) 393; (42) 295; (45) 296.
- in Minnesota, (42) 193.
- in Mississippi, (42) 495, 794.
- in Missouri, (42) 295; (43) 595.
- in Montana, (41) 394; (42) 193; (44) 696.
- in Nebraska, (42) 194; (43) 596; (44) 696.
- in Nevada, (41) 394.
- in New Brunswick, (41) 195, 895.
- in New Hampshire, (44) 897.
- in New Jersey, (42) 296; (43) 795; (44) 696.
- in New Mexico, (43) 596.
- in New York, (42) 296.
- in North Carolina, (41) 394; (43) 696.
- in North Dakota, (43) 297, 596.
- in Ohio, (42) 794.
- in Oklahoma, (42) 296.
- in Oregon, (42) 297.
- in Pennsylvania, (42) 297.
- in South Dakota, (41) 297; (42) 297.
- in Texas, (44) 897.
- in Utah, (42) 194.
- in Virginia, (41) 395; (42) 194.
- in West Virginia, (42) 395.
- law of Indiana, (44) 295.
- laws in Wisconsin, (43) 598; (46) 897.
- relation to agricultural extension, (42) 595.
- report of Federal Board, (42) 791.
- social objectives, (46) 193.
- treatise, (45) 193, 195.

Vocational—

- Rehabilitation Act, administration, (49) 194.
- rehabilitation in rural communities (46) 793.

Vocational—Continued.

- rehabilitation, report of Federal Board, (42) 793.
- schools for girls in New Jersey, (43) 596.
- schools, independent, of Massachusetts, (45) 397.

Vocations in agriculture, forestry, and animal industry, (47) 695.

Voisenet reaction, systematic study, (45) 312.

Volcanic ash—

- analytical studies, (45) 814.
- damage to vegetation, (42) 528.
- fertilizing value, (49) 23.

Volemite, (43) 801.

Voluntary muscle, vitamin B in, (49) U.S.D.A. 63.

Volutella—

- buxi, notes, (43) 849.
- circinans n.sp., studies, (41) Ill. 247.
- fructi, notes, (44) Pa. 745.

Volutin in *Azotobacter chroococcum*, (43) 124; (49) 731.

Volutin in fungi, (50) 428.

Wafers, energy content, (42) 660.

Wages and prices in India, statistics, (42) 291.

Wagner, P., eightieth anniversary celebration, (48) 400.

Wagon standards, (44) 198.

Walking, energy expenditure during, (47) 562.

Walking stick, injury to coconut, (46) Guam 748.

Wall boards, heat transmission, (49) Colo. 87.

Wallflower disease, new, (43) 544.

Walls—

- concrete, construction, (43) 188.
- heat transmission through, measuring, (50) 589.
- hollow tile, compressive tests, (50) 386.
- retaining, design and construction, (43) 485.
- retaining, reinforced concrete, design, (50) 286.
- thin, heat transmission and stability, (44) 88.

Walnut—

- aphis, control, (42) Calif. 852.
- aphis, dusting for, (41) 457; (43) 451.
- bacterial blight, (46) 144.
- bacteriosis, control, (43) 350.
- bacteriosis, spraying experiments, (46) 544.
- bacteriosis, studies, (48) Calif. 543.
- black, properties, (44) U.S.D.A. 537.
- blight and bacteriosis, identity, (43) 156.
- blight, control, Calif. (42) 843; (44) 247.
- blight, infection and resistance to, (47) 547.

Walnut—Continued.

- blight, notes, (41) 450, 453.
- blight resistance, tests, (48) Calif. 543.
- blight resistant varieties, (42) Calif. 843.
- blight, studies, (50) 753.
- cake, composition and digestibility, (45) 269.
- codling moth, notes, (41) 457, 665; (42) 547.
- crown rot, cause and distribution, (48) Calif. 543.
- culture, treatise, (41) 742.
- curculio, life history, (47) U.S.D.A. 556.
- die-back, probable causes, (42) Calif. 843.
- diseases, (42) 51; (43) 350; (47) Calif. 651.
- gloeosporium disease, (49) 847.
- hull maggot, life history, (46) U.S.D.A. 249.
- hull maggot pupae living two years, (49) 760.
- leaf blight, notes, (49) N.C. 747.
- little leaf, notes, (47) Calif. 626.
- oil, analysis, (42) 410.
- pests, control, new developments, (50) 52.
- residue, feeding value, (42) 369, 769.
- shell disease, (43) 754.
- shells, conversion into charcoal, (44) 117.
- shoot growth rate, nature of, (46) 127.
- tree moth, notes, (47) 551.
- trees, wilting caused by, (48) 451.
- winter injury or die-back, (42) Calif. 354.
- wood supply, foreign species for, (41) 839.
- worm in California, (42) 547.

Walnuts—

- American, description, (46) 342.
- black, for Kansas, (41) Kans. 46.
- black, management, (44) U.S.D.A. 837.
- black, peculiar variety, (45) 643.
- black, propagation and culture in Ohio, (42) Ohio 446.
- breeding, (44) Oreg. 836; (50) Can. 340.
- codling moth affecting, (44) 253.
- crosses, (47) Minn. 338.
- culture experiments, (46) Calif. 235; (47) Calif. 640; (49) N.Mex. 532; (50) Minn. 138.
- culture in Canada, (43) 746.
- culture in Europe and Asia, (50) 543.
- dying out in France, (46) 653.
- effect of freezing, (44) Calif. 738.
- effect of salts, (47) Calif. 626.
- English, grafting, (42) 737.
- English, winterkilling, (42) Minn. 834.
- fertilizer experiments, (49) 438.
- grafting, (50) 343.
- growth, daily, (45) 333.

Walnuts—Continued.

- growth rate, relation to sap concentration, (45) 124.
- Japan, crossing with butternut, (41) 447.
- manual on, (45) 240.
- nutritive value of proteins, (44) 461; (50) 462.
- Persian, culture in British Columbia, (46) Can. 141.
- Persian, industry in Oregon, (42) 43.
- production as affected by fertilizers, (48) Calif. 533.
- pruning experiments, (42) Calif. 139.
- self-sterility studies, (45) Ariz. 438.
- stocks for, (44) 145.
- storage temperature, (47) Calif. 640.
- time for transplanting, (43) Mo. 142.
- variability in yields, (42) Calif. 819.
- varieties, (41) 837.
- variety, notes, (48) Calif. 543.
- variety tests, (43) Md. 144.
- vitamin A in, (44) 765; (50) 462.
- vitamin in, water-soluble, (44) 461.
- winter injury, (47) Calif. 250, 835.
- Wampee hog pasture, (46) U.S.D.A. 874.
- War and agriculture, (49) 595.
- War damages, agricultural, estimating, (43) 290, 835.
- Warajicoccus, taxonomy and biology, (48) 459.
- Warble flies—*see also* Hypoderma spp. and Ox warble fly.
 - in Switzerland, (50) 560.
 - life history and treatment, (48) 881.
 - summary, (43) 55; (46) 661; (48) 751.
- Wardomyces anomala n.g. and n.sp., description, (50) 763.
- Warehouse system in North Carolina, (42) N.C. 89.
- Warehouses—
 - cooperative, accounts system, (45) 293.
 - cotton, construction and fire protection, (42) U.S.D.A. 390.
 - cotton, regulations, (42) U.S.D.A. 34.
 - farm products, operation, (42) N.C. 392.
 - wool, regulations, (43) U.S.D.A. 571.
- Wash bottle with continuous stream, (44) 111.
- Washing, energy expenditure during, (44) 66.
- Washington College, notes, (41) 100, 900; (42) 198; (43) 400; (44) 299, 899; (45) 400, 800; (46) 198, 300, 797; (49) 199.
- Washington Station, notes, (41) 100, 300, 500, 900; (42) 198; (43) 400, 499; (44) 299, 899; (45) 400, 800; (46) 198, 300, 797; (47) 600; (48) 600; (49) 199; (50) 196.
- Washington Station, report, (43) 798; (45) 299; (47) 599; (49) 298.

Washington Station, Western, bimonthly bulletin, (49) 97, 395, 599, 898; (50) 195, 598.

Washington Station, Western, bulletin, (45) 94, 198, 299, 497, 799; (46) 297, 498; (47) 196, 497, 599, 898; (48) 298, 498.

Washington Station, Western, monthly bulletin, (41) 299, 495, 699, 897; (42) 397, 599, 694, 899; (43) 197, 397, 496, 698, 798; (44) 95, 297, 394, 598, 698, 796.

Washington's home, Mount Vernon, as a farm, (45) 84.

Wasp, leafhopper, notes, (43) 662.

Wasps—

black digger, parasites of white grubs, (42) 549.

chalcid parasite of, (48) 556.

heredity in, (46) 463.

inheritance of mutations in, (47) 173.

masarid, taxonomy, (48) 460.

new species, descriptions, (42) 550, 752; (46) 160.

of Java, (41) 853.

parasitic, rearing, (46) 456.

petiolate, synopsis, (43) 60.

Philippine, descriptions, (42) 550.

Philippine, new, descriptions, (46) 58.

that hunt cicadas, habits, (50) 359.

treatise, (41) 759.

Wastes, industrial, treatise, (44) 725.

Water—

absorption by aerial parts of maritime plants, (43) 223.

absorption in soil, (46) Mo. 315.

alkali, use for irrigation, (42) Utah 276.

alkaline, effect on sprays and dips, (48) 651.

analysis, official method, (44) 9.

analysis, turbidity standard, (43) 613.

and chloroform, distribution of drugs between, (47) 15.

and soil mixtures, sedimentation curve, (46) 517.

autopurification in reservoirs, (49) 586.

Bacillus coli and B. aerogenes in, relative prevalence, (42) 275.

bacteriological content as affected by metallic salts, (49) 285.

bacteriological examination, (49) Mich. 483.

balance of the body, (46) 861.

boiler feed, regulation, (45) 83.

buffalo—

as dairy animals, (46) 573, 577; (49) 72.

characteristics and habits, (47) 670.

gestation of, (42) 669.

hides, loom pickers from, (47) 670.

milk of, analysis, (42) 363, 771.

milk of, food value, (42) 363.

trypanosome of, (43) 472.

Water—Continued.

- canal, factors affecting efficiency, (42) 384.
- carbon dioxid in, relation to pH, (44) 482.
- carbonated, viability of colon-typhoid group in, (46) 754.
- chlorin contamination, examination, (43) 478.
- colloidal state in, (43) 224.
- condensed, detection of sugar in, (49) 408.
- conductivity in sycamore, (47) 223.
- conductivity of ash and hazel wood, (43) 31.
- conductivity, preparation of, (42) 8.
- conservation, effect of cultivation, (42) 514.
- core in apples, (47) 342.
- culture experimentation, (48) 26.
- deoxygenation by sewage effluent, (41) 888.
- determination in agricultural products, (42) S.C. 413.
- determination in cereals, (42) 415.
- determination in cereals and meat products, (41) 799.
- determination in milk, (41) 799, 804, 805.
- diffusion through colloidal membranes, (42) 130.
- disinfectant in Argentina, (43) 392.
- distilled, H-ion concentration, for intravenous medication, (47) 203.
- distribution by capillary rise and by irrigation, (47) Calif. 618.
- drainage, analyses, (41) Ariz. 379.
- drinking, carbonates in, analysis, (44) 204.
- drinking, of Quebec, analyses, (41) 483.
- duty of, *see* Irrigation water.
- economy of the earth, computation, (47) 615.
- erosion test, (43) 279.
- evaporation from sanded and unsanded moor, (43) 20.
- examination, (41) 888.
- examination, *Bacillus coli* method, limitations, (50) 288.
- examination, nitrate-nitrogen determination, (44) 483.
- examination, standard methods, (44) 805; (50) 804.
- filter, homemade, description, (42) 575.
- filtration in soils, (42) 119.
- fixation in peat, nature of, (48) 815.
- flow—
 - as affected by afforestation, (43) 16.
 - calculating pipe sizes, (49) 685.
 - calculation in open channels, (42) 180, 681.
 - charts for, (44) 283.
 - in drain tile, formula, (43) U.S. D.A. 789.

Water—Continued.

- flow—continued.
 - in dredged drainage ditches, (43) U.S.D.A. 478.
 - in open channels, effect of curvature, (46) 283.
 - in open channels, measuring device, (43) 887.
 - in pipes, (42) 480.
 - in wood channels, (42) 681.
 - measurements, (42) 572.
 - through orifices, analysis, (47) 590.
- from alpine glaciers, studies, (47) 790.
- from Salton Sea, analyses, (44) Ariz. 513.
- gas tar for fence posts, (47) 291.
- glass as wound dressing for trees, (49) Ohio 235.
- glass, bibliography, (50) 615.
- glass, increasing volume of, (42) 507.
- grass, control in rice fields, (47) Calif. 631.
- ground—
 - control in Iowa, (42) 82.
 - for irrigation in Nevada, (44) 684.
 - in United States, (50) 685.
 - laws of movement and determination of quantity, (49) 82.
 - level of, control on meadows, (42) 29.
 - movement, (42) 422.
 - of California, (41) 785, 881.
 - resources in Connecticut, (44) 685.
- hard, softening, (41) N.Dak. 89, 484.
- hardness in United States, (44) 584.
- hemlock, identification, (42) 776.
- hemlock, poisonous to livestock, (42) 879; (45) Wyo. 479, Nev. 782; (49) Ind. 584; (50) 78.
- holding capacity of sandy soils, (47) Wis. 416.
- hot, effect on concrete, (46) 283.
- hot, effect on plants, (46) 544.
- hot, for soil disinfection, (42) 243, 450.
- hot, treatment for Japanese beetle larvae, (46) 252.
- hot waste, from power plants, use, (48) 818.
- hyacinth—
 - ash, analyses and use, (48) 428.
 - description and control, (46) 233.
 - eradication, (46) 138.
 - life history and control, (47) 39.
- in atmosphere, (49) 15.
- in soil—*see also* Soil moisture.
 - relation to soil, (43) 20.
 - storage and recovery, (49) U.S.D.A. 418.
- in tissues in beriberi, (47) 369.
- lactose-fermenting bacilli in, (41) 888.
- lettuce, *Anopheles* breeding among, (45) 256.
- level of moor soils, effect on meadow plants, (43) 623.

Water—Continued.

- level, variations due to canals and mines, (43) 210.
- locating, use of divining rod, (43) 478.
- measurement, Idaho (47) 685, 790.
- measurement apparatus, (42) 81.
- measurement devices for irrigation canals, (49) 886.
- measurement, verification of Bazin formula, (42) 573.
- metallic lactates in, (47) 282.
- meters, Venturi, computation of coefficient of discharge, (43) 477.
- movement as affected by forest areas, (44) U.S.D.A. 716.
- movement in loam soils, (49) 212.
- movement in plants, (42) 334, 729; (44) 824.
- movements in soils, (50) 84.
- occurrence and utilization, (42) 571.
- of bogs, oxygen content, effect of cloudiness, (46) 632.
- of Germany, nutrient content, (43) 728.
- of ponds, phosphoric acid content, (47) 20.
- of Santa Clara Valley, softening, (46) Calif. 537.
- of Utah, phosphorus, potassium, and nitrogen content, (41) 583.
- phenols in, detection, (45) 716.
- pipes, friction heads, calculating, (49) 284.
- plants as affected by light, (43) 431.
- plants, effect of organic matter on, (45) 220.
- pollution from sewage, (46) 589.
- potability in creosoted wood-stave pipe, (42) 481.
- potable—
 - bacteriological v. chemical analyses, (42) 384.
 - for country houses, (43) 392.
 - hygienic inspection of, (43) 478.
 - in Switzerland, studies, (43) 588.
- power—
 - development in California, (42) 479, 681.
 - development in South, (46) 381.
 - development in Wyoming, (49) 483.
 - in Union of South Africa, (45) 388.
 - of Cascade Range, (48) 781.
 - of Georgia, (45) 889.
 - of United States, (43) 280.
 - on the farm, (42) 81; (45) 184.
 - resources in France, (43) 790.
 - undeveloped in Southwest, (42) 479.
 - undeveloped, of Tennessee, (50) 483.
- protozoa in, (48) 817.
- purification, (41) 483, 583, 614.

Water—Continued.

- purification—
 - by activated silt, (48) 889.
 - by chlorin gas, effect of temperature, (50) 590.
 - for laboratory practice, (43) 279.
 - methods in Canada, (42) 575.
 - progress, (49) 285.
 - with lime, (47) 288.
- quantities used on Reclamation Service projects, (43) 85.
- radioactivity of, (48) 413.
- rain, *see* Rain.
- rat, Florida, notes, (42) 748.
- rate of solution of atmospheric nitrogen and oxygen, (41) 321.
- removal of iron and manganese from, (41) 484.
- requirements of crops, (50) 733, 828.
- requirements of crops in Alberta, (48) 586.
- requirements of Equisetum, (42) 628.
- resistance in fabrics, (42) 417.
- resources—
 - and geology of Sacramento Valley, (49) 587.
 - of California, (42) 478; (50) 84.
 - of Idaho, (47) 87.
 - of Switzerland as affected by forests, (44) 417.
 - treatise, (46) 687.
- rights in California, (42) 572.
- rights law, treatise, (42) 887.
- rights of western farmers, (44) U.S. D.A. 282.
- river, of India, seasonal variations in alkalinity, (42) 574.
- river, of Java, composition, (42) 421.
- river, pollution by waste from potash industry, (42) 719.
- running, in farm houses, (50) 486.
- samples, contamination from glass containers, (48) 711.
- seepage, return to lower South Platte River, (49) Colo. 82.
- settling periods, formula for calculating, (45) 188.
- soluble constituents of soil, effect of drying, (47) 215.
- spring, classification, (42) 574.
- stage registers, installation, (46) U.S. D.A. 688.
- stagnant, clarifying, (45) Okla. 487.
- sterilization by ultra-violet rays, (43) 479.
- sterilization, disinfectants for, (44) 679.
- still, Bourdillon, modification, (42) 8.
- storage, studies, (49) Mont. 184.
- stress of cotton, (47) U.S.D.A. 133.
- subterranean, and meteorologic agents, (49) 789.
- subterranean, arsenic and iodine in, (47) 288.

Water—Continued.

supplies—

- Egyptian, (44) 84.
- moorland, purification, (43) 478.
- public, industrial utility, (49) 587.
- purification, (43) 888.

supply—

- by means of cisterns, (43) 279.
- by use of gravel pits, (44) 784.
- chlorination of, (42) 575, 682.
- contamination, (43) Mo. 787.
- effect of forests, (41) 785.
- from snow fields, determination, (42) 715.
- from tube wells, (43) 386.
- in Casa Grande Valley, (44) Ariz. 584.
- increasing and conserving by re-forestation, (43) 16.
- installations for farmsteads, (48) 786.
- iron-depositing bacteria in, (42) 575.
- legislation in South Africa, (42) 459.
- of Atlantic slope and Gulf of Mexico basins, (44) 283.
- of California, (45) 790.
- of Canada, St. Lawrence and Hudson Bay drainage, (48) 681.
- of Colorado River Basin, (42) 887; (45) 889; (49) 184.
- of Columbia River and Pacific slope basins, (42) 887; (44) 282.
- of Egypt, (41) 483.
- of Gila and San Carlos Valleys, (42) 383.
- of Great Basin, (45) 889; (49) 184.
- of greenhouse, fungus flora in, (45) 841.
- of Gulf of Mexico basins, (50) 789.
- of Hawaii, (41) 883; (49) 789.
- of Hudson Bay and upper Mississippi basins, (42) 574; (50) 789.
- of Idaho, (49) 383.
- of lower Mississippi basin, (41) 883; (47) 589; (50) 186.
- of Mariut district, Egypt, (46) 816.
- of Meriden area, Connecticut, (45) 288.
- of Mississippi River basin, (48) 587.
- of Missouri River basin, (42) 383; (45) 289.
- of Nebraska, (44) 692.
- of Nevada, (41) Nev. 728.
- of New Mexico, (42) 183; (44) 685; (45) 184.
- of New South Wales, (42) 780.
- of North Atlantic drainage basins, (44) 380; (45) 789; (49) 685.
- of Ohio River basin, (44) 380; (48) 587.

Water—Continued.

supply—continued.

- of Pacific slope basins, (41) 289; (44) 189; (45) 289, 487; (48) 384; (50) 789.
- of Peru, (42) 384.
- of Philippines, (42) 779.
- of plants, (45) 730, 731.
- of St. Lawrence basin, (42) 574; (44) 283; (49) 383; (50) 789.
- of St. Mary and Milk Rivers, (44) 783.
- of Snake River basin, (48) 89, 781.
- of South Atlantic slope, (44) 188; (50) 789.
- of Southington-Granby area, (45) 790.
- of Tunis and use for irrigation, (45) 289.
- of United States, (42) 81; (49) 788.
- of western Gulf of Mexico basins, (42) 383; (48) 384; 781.
- of Wyoming, utilization, (49) 587.
- on farms, (41) 484; (42) 95, 282, 481, 575; (43) 479; (44) 888; (45) 187; (47) 187, 688, 689.
- on farms in Netherlands, (47) 91.
- on farms, pitcher pump installation, (47) 794.
- relation to national forests, (42) 681.
- rural, clarification and purification, (42) 187.
- rural, protection, (44) 87, 88.
- selection and protection of sources, (48) 89.
- underground, of Tasmania, (46) 779.
- surface temperatures, device for obtaining, (42) U.S.D.A. 620.
- system, hot and cold, for farm kitchen, (48) 889.
- systems, size of pipes for, (49) 483.
- tank system, small v. large, (48) Mo. 681.
- tanks, masonry, constructed on silos, (49) Iowa 788.
- tanks, reinforced concrete, construction, (47) 489.
- tap, zinc in, (41) 464.
- tidal saline, use for irrigation, (43) 185.
- treatise, (42) 274.
- tunnels, tables for designing, (46) 380.
- underground, and meteorological factors, (45) 417.
- underground, tracing, (45) 789.
- unfree, in soils, (45) 323.
- use by wheat on Great Plains, (49) U.S.D.A. 134.
- vapor condensation, relation to dust, (50) 414.
- vapor, saturated, movement through quartz flour, (46) 811.

Water—Continued.

- velocity in open channels, tables, (41) 582.
- waste, from gas works, (49) 216.
- waste, from potato-starch factories, purification, (42) 275.
- weed, Canadian, as silage plant, (41) 737.
- well, for irrigation, (50) 885.
- works, effect on ground water level, (43) 210.

Waterfowl—

- breeding grounds, (43) U.S.D.A. 49.
- lead poisoning in, (41) U.S.D.A. 581.
- migrations, (49) U.S.D.A. 351.
- of Nebraska and their food plants, (43) U.S.D.A. 49.
- under-water activities, (48) 51.

Watering places, desert, in Salton Sea region, routes to, (44) 283.

Watering troughs, concrete, construction, (43) 90.

Watermelon—

- anthracnose, control, (43) U.S.D.A. 348; (46) Tex. 343; (50) S.C. 648.
- bacterial wilt, control, (43) U.S.D.A. 245.
- blossom-end rot, cause, (49) Tex. 442.
- disease, studies, (41) Mo. 654.
- diseases, control, (48) U.S.D.A. 50.
- downy mildew, notes, (49) N.C. 747.
- leaves, temperature, (50) 425.
- Rhizoctonia disease, (47) Wash.Col. 541.
- seed oil, digestibility, (47) U.S.D.A. 560.
- stem and blossom-end rot, control, (46) Tex. 343.
- stem disease, notes, (45) 842.
- value against grasshoppers, (45) 151.
- wilt, control, (46) Tex. 343.
- wilt, studies, (43) Tex. 846.

Watermelons—

- as affected by alkalinity, (48) Calif. 524.
- shipments in Missouri, (43) U.S.D.A. 794.
- variety tests, (43) Tex. 36; (45) N.Dak. 235; (47) Miss. 831; (50) U.S.D.A. 137.

Waterproofing—

- agents for canvas, (46) 188.
- materials, colorless, exposure tests, (50) 887.
- materials for concrete, (49) 286.
- materials, tests, (49) 386.

Waterspout at San Juan, (45) U.S.D.A. 17.

Waterspout in the Adirondacks, (43) U.S.D.A. 719.

Waterworks, biology of, (41) 583.

Wattle insects, studies, (41) 354.

Wax moth caterpillar, epidemic, (49) 155.

Waxes—

- analysis, treatise, (49) 608.
- chemistry of, progress in, (41) 614.
- handbook, (45) 410.

Waxes—Continued.

- iron in, (43) 202.
- saponification number determinations, (43) 505.
- table of refractive indices, (45) 802.
- treatise, (45) 501, 801; (48) 206.

Wealth accumulation by farmers, (49) 290.

Weather—*see also* Meteorological observations and Meteorology.

- and climate of Vermont, (49) 208.
- and crop yield, correlation, (44) 414.
- and crop yields in Scotland, (49) 115.
- and crops in Arkansas, (44) U.S.D.A. 121.
- and crops in England, correlation, (47) 809.
- and cyclical fluctuations, (48) 613.
- and forest fires, (50) 807.
- and harvest cycles, (47) 719; (48) 613.
- and literature, (44) U.S.D.A. 416.
- and solar variation, (43) 809; (44) 313.
- and sunspots, (45) 617.
- artificial control, (45) U.S.D.A. 319.

Bureau—

- activities, (44) 616.
- fruit-frost service in California, (48) 808.
- historical account, (49) U.S.D.A. 718.
- monograph, (48) 808.
- report, U.S.D.A. (41) 417; (43) 318; (44) 714; (47) 316; (49) 508.
- West Indies and Caribbean service of, (48) 300.
- work in West Indies, (42) 620.
- changes, effect on soil temperature, (44) 617.
- conditions during winter of 1922-23 and solar radiation, (50) 314.
- conditions in 1921, (46) U.S.D.A. 510.
- conditions, optimum for tea crop, (49) 15.
- conditions, relation to plant diseases, (44) Mass. 445.
- conditions unfavorable to agriculture, (50) 615.
- control, (46) 418; (50) 616.
- correlation with potato late blight, (50) N.J. 47.
- crop forecasts from, (47) 209.
- damage to cotton, (49) U.S.D.A., 33.
- damage to crops, (44) U.S.D.A. 118.
- effect on—
 - alfalfa seed production, U.S.D.A. (41) 716, 732.
 - citrus diseases, (50) 752.
 - corn and cotton, (44) U.S.D.A. 119.
 - corn yield, U.S.D.A. (41) 810; (44) 118.
 - crops, (42) 116; (44) 715; (45) 16; (47) Minn. 116; (48) U.S.D.A. 713.

Weather—Continued.

effect on—continued.

crops, treatise, (44) 507.

flour milling, (46) 860.

fruitfulness in the plum, (41) 445.

wheat yield in Manitoba, (42) 617.

winter wheat, U.S.D.A. (41) 810; (42) 616, 620.

exposure, effect on superphosphate, (46) 219.

forecasting—

and atmospheric movements, (47) 509.

in British Isles, (50) 314.

local, (50) 12.

papers on, U.S.D.A. (43) 120, 511.

present status, (50) 208.

rôle of cirrus clouds in, (43) 319; (46) 711.

use in agriculture, (42) 212.

forecasts, amplified, (47) 209.

forecasts, long-period, (46) 16.

hot, and humidity, (43) U.S.D.A. 718.

influences in British Isles, (50) 416.

insurance, (47) 209.

notation, Beaufort, (41) 808.

of British Isles, (41) 809.

of British Isles, 1923, (50) 716.

of Canada, (41) 211.

of Finland in 1920, (45) U.S.D.A. 17.

of 1922, (48) U.S.D.A. 715.

of 1923, (50) U.S.D.A. 808.

of 1924, (50) 616.

of Palestine, effect of wind direction, (50) 616.

of Scotland, (45) 18, 808.

of Scotland in 1922, (49) 615.

of Texas, effect of Gulf water-surface temperatures, (50) U.S.D.A. 115.

of United States, 1917, (41) U.S.D.A. 417.

on New England farm, (46) 116.

periodicity in, (43) 416.

popular account, (45) U.S.D.A. 722.

popular fallacies, (41) 810.

prediction by numerical process, (48) 613.

proverbs and paradoxes, treatise, (50) 415.

records at lookout stations, (47) 116.

relation to plant development, (41) 222.

relation to railroading, (47) U.S.D.A. 316.

report, daily, British, new form, (42) U.S.D.A. 620.

reports for Alaska, (50) Alaska 510.

reports, wireless exchange by vessels, (45) U.S.D.A. 321.

seasonal variations, correlation, (50) 510.

service of United States, origin and growth, (50) 808.

seven-year period. (44) U.S.D.A. 415.

textbook, (43) 208.

Weather—Continued.

weekly notes, U.S.D.A. (46) 596, 789;

(47) 94, 194, 395, 492, 693, 797,

895; (48) 189, 294, 390, 492, 790;

(49) 90, 294, 390, 594, 693, 793, 892; (50) 92, 294, 491.

world, treatise, (50) 12.

Weathering and soil formation, (46) 619.

Webbing clothes moth, notes, (41) 661, 757.

Webbing in stored grain, paper on, (42) 153.

Weber-Fechner law, discussion, (47) 128.

Webworm—

fall, in South Dakota, (46) 750.

fall, natural control, (49) 555.

fall, notes, (41) U.S.D.A. 462, 662; (46) 51.

fall, parasites of, (50) 844.

grass, notes, (45) Mich. 251.

silver-striped, studies, (49) 655.

striped sod, summary, (49) 656.

Webworms, summary, (47) U.S.D.A. 458

Weed—

laws in different countries, (42) 137.

pests, notes, (49) 599.

seed tests, (47) Iowa 234.

seeds—

analyses, (41) Can. 565; (44) N. Dak. 386.

buried, viability, (41) Iowa 227

dissemination, (44) Colo. 233.

identification, (46) Can. 168.

in alfalfa, (45) 825.

in clover crops, (44) 733.

list, (44) Me. 439.

of Colorado, (45) Colo. 43.

poisonous, guide, (47) 81.

scented, in wheat, (50) 438.

tolerance limits in, (46) 732.

use as war time feeding stuff, (42) 369.

vitality tests, (44) Iowa 432.

survey of Ontario, (49) 825.

Weeds—

and seeds in Indiana, (50) 740.

and seeds in Wisconsin, control, (45) 537.

and weed seeds of Canada, (46) 443.

as source of mosaic infection, (47) Ind. 147.

control, (41) 228, 537, 538, 638, 644.

Colo. 646, 737, 833; (44) N.Dak.

88; (45) 809; (46) N.J. 137, 536.

control—

and eradication, (44) U.S.D.A. 136.

in Canada, (44) 234.

in coniferous nurseries, (43) 42.

in Germany, (42) 440.

in pastures, (50) 338.

in rice fields, (41) Tex. 38; (49) Calif. 229, U.S.D.A. 434.

in Sweden, (42) 137.

law in Idaho, (41) Idaho 236.

methods, (49) Wis. 630.

through spraying, (49) 738.

Weeds—Continued.

- definition, (50) 439.
 - depreciating meadows, (46) 129.
 - description and control in Scotland, (47) 636.
 - effect on soil moisture and nitrate formation, (41) Kans. 33.
 - effect on tree growth, (47) Tex. 439.
 - eradication—
 - and control, (47) Ind. 138.
 - bagasse paper for, (45) 438.
 - cooperative experiments, (46) 226; (49) 825.
 - experiments, in Ontario, (42) 230.
 - from lawns, (43) N.Y.State 535.
 - handbook, (45) 438.
 - in nursery seed beds, (48) 240.
 - in pastures, (42) Va. 437.
 - studies, (42) Va. 439; (46) 844.
 - with salt, (46) 733.
 - growth in Denmark, (45) 740.
 - habits and eradication, (48) N.Dak. 136.
 - identification of fruits and seeds, (41) 537.
 - in Argentine wheat fields, (41) 646.
 - in California, control, (47) 234.
 - in Ceylon, (50) 238.
 - in Colorado, (41) Colo. 646.
 - in cornfields, control, (47) 235.
 - in Great Britain, manual, (48) 441.
 - in Indiana, (50) 641.
 - in Iowa, (47) Iowa 734.
 - in Kansas, (42) 238; (44) Kans. 439.
 - in Manitoba, (44) 439.
 - in Montana, (44) 833.
 - in Morocco, (42) 230.
 - in North Carolina, (41) 833.
 - in Ontario, (42) 229.
 - in Sudan grass seed, (46) 838.
 - in Sweden, (48) 836.
 - introduced into Michigan, (41) 646.
 - introduced into Victoria, (48) 441.
 - new, in New South Wales, (46) 137; (47) 39.
 - new western, (47) 829.
 - of farm land, treatise, (44) 833.
 - on arable land, effect of fertilizers, (50) 740.
 - poisonous to livestock in Alberta, (42) 776.
 - recent, control (44) Pa. 737.
 - relation to plant diseases, (41) 537.
 - seasonal occurrence, (44) 134.
 - self-sowing, distribution in Russia, (49) 37.
 - silage from, (41) Colo. 646.
 - studies, (50) Minn. 137.
 - study in elementary schools, (41) 298.
 - toll in Indiana, (48) 441.
 - transpiration, (41) Iowa 227.
 - treatise, (41) 442.
 - utilization in feeding, (41) 537.
- Weeks Law, benefits from, (45) 744.

Weevil—

- borer, black, paper on, (42) 451.
- broadnosed, notes, (41) Fla. 548.
- fauna of South India, (47) 761.

Weevils—

- important, in Porto Rico, (49) 56.
- in beans and peas, summary, (48) U.S.D.A. 359.
- in stored grain, destruction, (49) 455.
- injurious, in South Africa, (45) 258.
- injurious to legumes, bionomics, (48) 57.
- instincts and habits, (50) 359.
- new from Asia, (43) 163.
- new tropical, (43) 562.
- of superfamily Curculionoidea, (41) 261.
- pulse, enemies and control, (42) 158.
- Weight burette for gas analysis, (43) 611.
- Weight regulation in human body during overnutrition, (47) 461.
- Weights and measures, coefficients and equivalents in metric system, (48) 97.
- Weir discharge, method of determining, (45) 789.
- Weir formulas, (42) 274, 573, 681.
- Weir, Herschel type, studies, (48) 286.
- Weirs—

- adjustable proportional, drawings, (49) 886.
- construction, (49) 789.
- stilling rack for, (44) 283.
- submerged Cippoletti, diagrams, (48) 884.

Well waters—

- composition in Connecticut, (44) 685.
- composition of salts in solution, (45) Colo. 118.
- for irrigation, (43) 279.
- of Italy, (48) 814.

Wells—

- artesian and shallow, boring, (45) 387.
- boring, (50) 587.
- boring, artesian and shallow, (43) 477.
- concrete linings and curbs for, (43) 90.
- contamination and protection, (43) 392.
- digging in New Mexico, (42) 572.
- farm, construction, (47) 489.
- hygienic inspection of, (43) 478.
- in California, water levels in, (45) 487.
- pollution, (46) 589.
- pollution from *Bacillus coli*, (50) 83.
- tube, relation to subsoil water, (43) 386.
- West Indian Agricultural College, notes, (46) 399; (48) 100; (49) 95.
- West Virginia—
 - Station, notes, (41) 100; (43) 100; (45) 200; (46) 199; (47) 300, 498; (48) 300, 899; (49) 199; (50) 900.
 - Station, report, (48) 298; (50) 195.
 - University, notes, (41) 300, 500; (45) 200; (46) 199; (47) 498; (48) 899; (49) 199; (50) 700, 900.

Whale—

- manure, nitrification, (46) 516.
- meat as food, (41) 65.
- meat, composition and digestibility, (42) Calif. 861.
- meat, value as food, (48) 257.
- muscle, composition, (43) 569.
- oil, hardened, arsenic and nickel content, (42) 610.
- oil soap, insecticidal value, (48) Ky. 357.

Wheat—

- Acme, origin and characteristics, (47) S.Dak. 137.
- action of copper on, (45) 29.
- adaptation to meteorological environment, (42) 511.
- adaptation to nutrient deficient media, (50) 326.
- affected with black stem rust, time of cutting, (42) 448.
- Alaska-grown, for pastry flour, (47) 764.
- amino acid content, (41) 367.
- analyses and use as feeding stuffs, (45) 373.
- and barley, yielding capacity, (48) 831.
- and corn products, analyses, (45) N.Y. State 469.
- and flax as combination crops, (49) Minn. 431.
- and flour, correlation between characters, (48) Me. 440; (49) 231.
- and oats, culture experiments, (47) Minn. 331.
- and rye hybrid, fertile, (41) 645.
- and rye middlings, analyses, N.J. (43) 69; (47) 571.
- and rye, natural hybridization in Russia, (48) 735.
- and rye products, analyses, N.Y.State (45) 469; (47) 172.
- anthracnose, studies, (42) 351.
- antineuritic vitamin in, (41) 466.
- as affected by—
 - alkali salts, (41) 320, 623.
 - ammonium sulphate, limits of toxicity, (42) 219.
 - arsenic, (44) 512.
 - borax, (44) Me. 129.
 - chromium, (50) 820.
 - ferrous oxid, (46) 717.
 - fertilizers, (48) 324.
 - formaldehyde, (48) 127.
 - humus, (47) 120.
 - inorganic nitrogen, (48) 633.
 - iron, (42) 218; (46) 629.
 - lead, (50) 820.
 - manganese, (41) 521.
 - potash, (49) 817.
 - potassium chromate, (48) 323.
 - preceding crop, (44) Calif. 731.
 - salt, Calif. (48) 515, 524.
 - silicates, (46) 717.
 - slag, (48) 723.
 - sodium arsenate, (47) 120.

Wheat—Continued.

- as affected by—continued.
 - sodium arsenite, (41) 625.
 - sodium chlorid, (45) 586.
 - sodium sulphate, (45) 116.
 - sulphur, (45) 426; (46) Wash. 427; (50) Oreg. 724.
 - superphosphate, (47) Minn. 124.
 - Tilletia tritici, (45) 144.
 - tin, (46) 716.
 - urea superphosphate, (45) 330.
 - weather, (47) Minn. 116.
- as dry farm crop, culture, (41) U.S.D.A. 442.
- as dry farm crop, fall-sown, (41) Ariz. 332.
- as green manure, (46) 320.
- as hay crop, (41) Alaska 30; (47) Calif. 631.
- as hog feed, (49) Mich. 898.
- as nurse crop, (41) N.J. 35; (43) Wash. 737; (47) Ohio 137; (48) N.Dak. 29.
- as phytometer, (41) 327.
- Australian, weevils in, (41) 758.
- bagged, effect of humidity changes, (46) 137.
- Banat, description, (49) 335.
- bearded and smooth, comparative yields, (41) Del. 39.
- belt, harvest labor problems, (47) U.S.D.A. 192.
- belt, rent contracts in, (43) U.S.D.A. 290.
- Berkely Rock, description, (46) Mich. 535.
- black chaff, notes, (41) Iowa 245, 246; (43) Okla. 44.
- black point, (50) 144, 649.
- black rust in southwest Wales, (48) 145.
- black rust in western Europe, control, (49) U.S.D.A. 146.
- black rust, notes, (44) 48; (45) 48.
- black stem rust, inoculation experiments, (50) 839.
- blackhull, description, (50) 538.
- blight, (46) 240.
- blooming time, (41) 440.
- border effect, studies, (48) 435.
- bran—
 - analyses, (41) N.H. 68, Conn.State 176, Ariz. 367, Can. 564, Ind. 564, R.I. 564, Ind. 868, N.Y. State 868; (42) Mich. 63, 263, 560, Ind. 769, N.H. 769, Tex. 769, Mass. 866; (43) N.J. 69, Ind. 69, Ky. 373, Vt. 464, N.J. 672, R.I. 672, 867, Ind. 867; (44) 267, Mass. 671, N.H. 671; (45) Tex. 68, N.Y.State 469, N.J. 775, 872, R.I. 872, Vt. 872; (46) Can. 167, Mich. 168, N.H. 675, Tex. 675; (47) N.Y.State 172, Mass. 274, 275, N.J. 571; (48) 68, Me. 68, Can. 368.

Wheat—Continued.

bran—continued.

- analyses and digestibility, (45) 468.
- and middlings, (47) N.Y.State 172.
- and red dog flour, (47) N.Y.State 172.
- and screenings, analyses, (47) R.I. 571, 668.
- ashes, analyses, (46) 823.
- Canadian, composition, (41) 565.
- composition and retail prices, Conn.State (44) 176; (45) 374; (47) 570.
- digestibility, (41) U.S.D.A. 64; (42) 457.
- digestibility and productive value, (47) Tex. 472.
- digestibility coefficients, (48) 574.
- effect of flour extraction, (44) 867.
- energy value, (47) 69.
- feeding value, (41) Mass. 276.
- food value, (42) 459.
- middlings, and red dog flour, analyses, (47) N.Y.State 172.
- phytic acid of, composition, (44) N.Y.State 410.
- phytin content, (47) 366.
- proteins of, (41) 262; (50) 711.
- structure, (46) 69.
- vitamin A and B in, (46) 256.
- vitamin B concentration from, (49) 160.
- with screenings, analyses, (44) Mich. 568; (46) 871.
- breeding experiments, (41) Alaska 31, Kans. 48, 235, Ariz. 332, 338, N.C. 638, Minn. 730; (42) 636, Minn. 824; (43) Ky. 332, Ariz. 734, Mo. 736, Wash. 737, Ky. 824; (44) Kans. 224, Alaska 327, Alaska 329, Alaska 521, Ariz. 524, 526, 633; (45) Mo. 224, N.Dak. 225, Okla. 431, Ariz. 435; (46) 633; (47) Okla. 824; (48) N.Dak. 30, Mich. 224, 434, 629, S.C. 629; (49) 36, 329, Tex. 429, S.Dak. 527, Idaho 732, U.S.D.A. 825; (50) 28, Minn. 132.
- breeding in Egypt, notes, (44) 500.
- breeding in Italy, (50) 333.
- breeding, pure lines, (43) Me. 641.
- bud-sports, (43) 534.
- bulb fly, life history, (42) 152; (45) 557.
- bunt, *see* Wheat smut, stinking.
- by-products, composition and feeding value, (47) Tex. 69.
- by-products, Federal price control, (42) 492.
- Canadian, movement, (47) 595.
- chalk v. lime for, (46) 716.
- charred, nitrogen availability, (47) Tex. 217.

Wheat—Continued.

- chemical changes during germination, (48) 430.
- chimeras, speltoid, (43) 534.
- chlorosis, relation to pH of nutrient solutions, (47) 729.
- chromosome relationships in, (46) 430.
- classification, (49) U.S.D.A. 825.
- climatic requirements, (41) U.S.D.A. 417.
- climatology in Italy, (48) 315.
- clipping tests, (42) Ohio 830.
- club, description, (49) U.S.D.A. 335.
- commercial classes, milling and baking qualities, (49) 830.
- commercial outlook, (50) 594.
- composition as affected by premature freezing, (43) 501.
- composition, changes in, (44) 502.
- composition, studies at experiment stations, (46) 607.
- contamination from scented weed seeds, (50) 438.
- continuous culture, (41) N.Dak. 139, N.Dak. 822, 825; (42) 98; (49) Okla. 428.
- continuous culture v. fallowing, (42) Calif. 822.
- cost and price indexes, (43) Mo. 792.
- cost before and after the war, in France, (42) 593.
- cost of production, (41) Minn. 91; (42) Mo. 188; (43) Ohio 392; (44) N.Dak. 88, N.Dak. 190, N.J. 385, Mo. 790, N.Dak. 790; (45) U.S.D.A. 190, 191, 293, U.S.D.A. 796; (46) Mo. 387; (47) Mo. 192, Idaho 593, Wash.Col. 594; (49) Wash.Col. 291, Ind. 592, N.Y.Cornell 691; (50) Ind. 389, Can. 591.
- cost of production—
 - in Argentina, (43) 487.
 - in Belgium, (49) 895.
 - in Colorado, (44) U.S.D.A. 789.
 - in England, (48) 890.
 - in France, (50) 191.
 - in Italy, (46) 291.
 - in Kansas, (43) 593.
 - in Minnesota, (42) 36.
 - in Westphalia, (47) 93.
- cracked, analyses, (46) Tex. 675.
- cracked, digestibility and productive value, (47) Tex. 472.
- crop, improvement, in Canada, (44) 232.
- crop variation, (46) 137.
- cross, inheritance of glume length, (50) 27.
- cross, inheritance of growth habit and stem rust resistance, (49) 750.
- cross, reaction to Puccinia forms, (48) 644.
- cross, studies, (49) 36.
- crosses, genetic behavior of spelt form, (46) 333.

Wheat—Continued.

crosses, inheritance of black stem rust resistance, (50) 634, 635.
 cross-pollination, effects, (46) 136.
 cultural directions, (46) Wash. 437.
 culture, (44) Alaska 328; (45) 630;
 (46) Mo. 34; (49) Alaska 491.

culture—

after fallow, (47) Oreg. 533.
 along the Nile, (46) 495.
 continuous with and without manure, (49) Okla. 434.
 effect of meteorological phenomena, (42) 511.

experiments, (41) Kans. 33, Nebr. 36, N.Dak. 139, Idaho 226, 229, 334, Nebr. 433, Can. 528, 529, Mo. 637, 639, 729, N.Dak. 822, N. Dak. 824, Ill. 832; (42) 132, N.Dak. 732, Minn. 824, Ohio 830; (43) Ky. 332, Mont. 332, 528, Wash. 737, Wash. 738, Mont. 739, 824; (44) N.Dak. 31, Alaska 522, Utah 525, 526, 530, 632, 633, Calif. 731, 733, 827; (45) 35, N.Dak. 225, Mont. 339, 340, Wash. 436, Nebr. 531, 532, 631, N.Dak. 734, 735; (46) 227, 436, 437, 634, U.S.D.A. 724, Mont. 830; (47) U.S.D.A. 330, Alaska 526, Wash.Col. 529; (48) N.Dak. 30, Ariz. 434, Can. 450, 629, 630; (49) 329, Tex. 429, U.S.D.A. 630, Can. 734; (50) 28.

experiments in the Sudan, (46) 34.
 farm practices in, (43) U.S.D.A. 437.

in Argentina, (41) 645, 646; (45) 536.

in Australia, (48) 630.

in Brazil, (44) 530.

in British Columbia, (42) 733.

in Burma, (41) 529; (42) 436.

in East Africa, (42) 533.

in Greece, (46) 535.

in India, (42) 480.

in Manitoba, (43) 640.

in Mesopotamia, (44) 232.

in Morocco, (49) 595.

in South Africa, (41) 528.

in Uganda, (42) 32.

in Wisconsin, (42) Wis. 533.

on sandy soils, (41) Wis. 18.

on Yuma project, (43) U.S.D.A. 393.

cutting stage, (50) 237.

damage from various causes, (44) U.S.D.A. 118.

deformation, cause, (49) 246.

development, changes during, (49) 830.

development, photoperiodism in, (49) Wash.Col. 223.

dietetic value, (47) 668.

digestibility coefficients, (48) 574.

Wheat—Continued.

disease, causing premature ripening, (49) Ky. 541.

disease, in New South Wales, (44) 843.

disease, new, in France, (47) 45.

disease resistant varieties, (45) N.Dak. 225; (50) Minn. 143.

disease survey in India, (46) 544.

diseases, (43) 45; (44) 232; (48) Can. 144.

diseases, bacterial, studies, (41) 543.

diseases, control, (43) Tex. 845.

diseases in Java, (41) 544.

diseases in New South Wales, (46) 545.

distribution in Australia, (48) 597.

dockage for 1918, (44) N.Dak. 386.

dockage, method of determining, (43) U.S.D.A. 535.

dockage removal at thresher, (46) 100; (47) 91.

double germination of, (45) 532.

downy mildew in United States, (45) U.S.D.A. 445.

drilling experiments, (42) Ohio 632; (46) Mont. 327.

drought-resistant varieties, (43) Wash. 737.

durum—

and bread, crossing experiments, (41) 235.

as affected by Hessian fly, (41) Kans. 34.

as bread wheat, (46) 536.

new varieties for South Dakota, (42) S.Dak. 827.

red, milling and baking tests, (43) N.Dak. 366.

selection, (49) 736.

varieties, (49) U.S.D.A. 37.

ear cockles in, (41) 747; (43) 243, 445; (44) 343.

Early Baart, description, (48) Ariz. 232.

eelworm disease, (43) 751.

effect of—

cutting back, (48) Calif. 527.

fallowing, (48) Minn. 322.

liming, (47) 121.

nitrate applied at different stages of growth, (47) 233.

number of plants per hill, (41) N.J. 36.

pH values, (50) 232.

position of grain, (41) N.J. 36.

preceding crop, (48) N.Dak. 29, N.Dak. 30; (49) Ohio 329, Ohio 724.

premature harvesting, (46) 36.

straw mulch, (49) Ohio 329.

tillage methods, (49) U.S.D.A. 828.

weather on composition, (45) Can. 823.

effect on—

England's neutrality during Civil War, (42) 894.

Wheat—Continued.

- effect on—continued.
 following crop, (44) R.I. 33; (45) N.Dak. 226; (49) Mont. 129.
 nitrate accumulation in soils, (41) 812.
 soils, N.Dak. (41) 124, 139.
 endosperm, distribution of enzymes and proteins in, (45) 363.
 eradication of wild popples in, (46) 138.
 ergot, notes, (46) 239, 240; (48) 741.
 exotic, tests in Algeria, (45) 35.
 experiments, continuous, yields, (50) 637.
 exports from Argentina, (43) 95.
 exports from Australia, (45) U.S.D.A. 204.
 fall planting, (43) Wash. 738.
 fallowing experiments, (46) 35.
 false wireworm injury, (41) 260.
 farm and market prices, (48) U.S.D.A. 92.
 farm storage of, (49) Kans. 489.
 feed, analyses, (47) Ind. 473, Conn. State 570, N.J. 571.
 feeding flour, analyses, (43) N.J. 69.
 feeding value for poultry, (48) 75.
 feeding value in pork production, (46) 674.
 fertilizer experiments, (41) N.Y.Cornell 21, Kans. 33, Del. 136, Del. 137, 229, 326, 334, 425, Can. 528, 529, 535, Mo. 628, Mo. 644, 814, N.Dak. 823, 825, Ill. 832; (42) Va. 21, 23, 132, 218, N.Y.State 326, 330, 517, Ohio 636, 719, 723, Minn. 731, Ala. Col. 822, Calif. 822, Minn. 824; (43) 126, Idaho 227, Ky. 332, 518, 528, Wash. 722, Ohio 726, Can. 729; (44) 127, Kans. 225, 317, Minn. 321, Del. 431, Ky. 511, 526, 530, Mich. 530, 632, 733, 815, 827; (45) 35, Ill. 121, Ohio 126, N.C. 430, 532, 735; (46) 227, Ohio 334, 435, Kans. 435, 437, 634; (47) 26, Miss. 217, 419, Wash.Col. 520, 814, Okla. 824, Ohio 828; (48) 227, Minn. 322, Ariz. 434, R.I. 518, 520, 629, 630; (49) 20, 31, 329, Kans. 427, Ga. 524, Ohio 738, 825; (50) 28, Minn. 120.
 field damaged, for poultry, (42) Md. 170.
 flag smut—
 control, (43) Ill. 844; (45) 49, U.S.D.A. 245.
 description, (49) U.S.D.A. 841.
 in United States, (41) U.S.D.A. 746.
 notes, (41) 843; (44) 152; (47) 840.
 resistance, (49) Ill. 343.
 studies, (47) Ill. 838.
 varietal resistance, Ill. (49) 343, 541.
 flour, *see* Flour.

Wheat—Continued.

- flour, equivalent tables, (48) 233.
 flour substitutes, insects affecting, (41) 162.
 flowers, emasculated, fertilization, (41) 440.
 following different crops, (45) N.Dak. 226.
 following Kafir corn, (41) Kans. 34.
 following pastured-off green crops, (41) 826.
 following peas, (41) Idaho 38.
 foot and root rot, differences in susceptibility, (47) Minn. 347.
 foot and stalk disease, (41) 655.
 foot disease, (43) 750.
 foot rot, description, (42) 244.
 foot rot in Kansas, (50) 649.
 foot rot in Northwest, (42) 351.
 foot rot, notes, (43) 445; (45) Ind. 143, 845; (46) 44; (47) 247, Wash. Col. 541; (49) 45, Wash.Col. 241, Kans. 443, Ore. 538, 541; (50) 244.
 for silage, (41) Mo. 334.
 formaldehyde treated, germination, (46) 241.
 French importations, (45) U.S.D.A. 89.
 frosted, milling and baking tests, Mont. (46) 327; (48) 135.
 fumigated, hydrocyanic acid absorption and retention, (49) U.S.D.A. 456.
 fungi affecting, (44) Minn. 745.
 Fusarium blight, (44) 243, 642; (46) U.S.D.A. 240.
 Fusarium disease, (43) 345, Mo. 749; (44) 747; (50) 648.
 genetics of square-headedness and density, (47) N.Y.Cornell 738.
 geniculate spikes in, (50) 728.
 germ meal, analyses, (42) 769.
 germination, effect of—
 bunt treatment, (50) 144.
 fertilizers, (44) Va. 721.
 H-ion concentration, (43) 525.
 organic substances, (41) 523.
 resting period, (42) Wis. 338.
 soil acidity, (47) 722.
 germination, fertilizer injury to, (50) N.J. 216.
 germination, forcing, (48) 633.
 gliadin, hydrolysis products, (50) 8.
 gliadin, rate of hydrolysis, (48) 202.
 glume blotch, notes, (44) Conn.State 150; (47) Ark. 748.
 glume rot, basal, (42) 844.
 glume rust, (45) 845.
 glume spot, (43) Can. 750.
 gluten content, (43) Me. 641.
 gluten, phosphoric acid in, (48) 311.
 grade requirements, (43) U.S.D.A. 535.
 grades, factors affecting, (47) Md. 435.
 grading and handling, (41) U.S.D.A. 636.
 grading, announcement, (43) U.S.D.A. 832.
 grading, equitable, (43) N.Dak. 642.

Wheat—Continued.

- grain-bug injury, (41) U.S.D.A. 355.
- grains, double embryos in, (50) 833.
- grass—
 - cultural directions, (45) N.Dak. 225.
 - culture experiments, (44) N.Dak. 524.
 - seed, testing, (50) 740.
 - seedling experiments, (48) N.Dak. 224.
 - slender, (41) Idaho 225.
- grasses, analyses, (41) Wyo. 333.
- green manuring experiments, (41) N.J. 19, Del. 136, Idaho 226; (44) N.J. 321; (46) N.J. 514; (48) N.J. 324.
- green manure v. rotted manure for, (49) Can. 734.
- ground, analyses, (45) Tex. 68.
- growth in alkali soil, early, (42) Utah 28.
- growth in artificial light, (48) 26, 835.
- growth in sand cultures, (44) N.J. 325.
- hairs as index of flour quality, (48) U.S.D.A. 503.
- handling and grading in America, (42) 491.
- hard, of Morocco, (49) 736.
- harvest dates; temperature influence on, (41) U.S.D.A. 716.
- harvesting in Argentina, (47) 32.
- harvesting, tractor costs, (41) 790.
- harvests and prices in France, (42) 287.
- harvests, historical account, (46) 389.
- hauhm, statocytes of, (44) 728.
- hay, feeding value, Calif. (44) 775; (47) 673.
- hay, nutritive value, (47) Calif. 668.
- hay yields, (49) Mont. 430.
- hay yields in Australia, (46) 132.
- heads, anatomical structure, (43) 328.
- heads, effect of length on successive generations, (43) S.Dak. 235.
- heads, partial smutting of, (43) 750.
- heat-damaged, chemical test, (47) 205.
- heating prevention by air-tight storage, (42) 237.
- Helminthosporium blight, (48) N.Dak. 44.
- Helminthosporium disease, (44) Minn. 244, Minn. 745; (45) N.Dak. 242; (49) 244; (50) 649.
- hemipteran pest, (41) 551.
- Hessian fly injury, (41) Kans. 34.
- Hessian fly injury, relation to fertilizers, (44) 626.
- hybrid resistant to stem rust, (48) Calif. 545.
- hybridization, technique, (45) 737.
- hybrids, chromosome number variations, (49) 25.
- hybrids, internode length and number of spikelets, (50) 633.
- hybrids, sterility in, Me. (48) 433; (50) 26, 27.

Wheat—Continued.

- improved strains, (44) Me. 141.
- improvement, (49) N.C. 733.
- improvement by selection, (46) 830.
- improvement in India, (41) 522, 529.
- impurities, (44) 531.
- Indian, analyses, (44) Ariz. 568.
- Indian, in Mesopotamia, (43) 831.
- industry in Victoria, further development, (42) 593.
- industry, westward movement, (44) 438.
- infection by stinking smut, effect of moisture, (49) Idaho 745.
- inheritance of—
 - characters, (41) 235; (42) 133; (47) Minn. 331, 737.
 - earliness, (44) 637; (46) 35.
 - glume-length and grain-length, (44) 832.
 - kernel and spike characters, (50) 732.
 - rust resistance, (44) 50.
- injury by squirrels, (43) Wash. 351.
- injury from seed treatment, (48) 545.
- insect survey in Ohio, (41) 162; (42) Ohio 648.
- insects affecting, (43) 253; (44) 232, 548.
- inspection, (41) Mont. 39.
- insulin in, (50) 767.
- international production and trade, (44) 490.
- intracellular bodies in, (50) 839.
- irrigation affecting protein content, (41) Idaho 535; (44) 833.
- irrigation experiments, (41) Nev. 231, Nebr. 433, Nev. 728; (42) Utah 276; (43) Nev. 228, Utah 230, Nebr. 637; (44) 633; (46) 436, 634; (48) 233.
- irrigation experiments in India, (42) 183, 480; (46) 487.
- irrigation water requirements, (47) Kans. 630.
- joint rot, notes, (49) 541.
- jointworm, control, (42) Ohio 648, U.S.D.A. 752.
- jointworm, notes, (41) 755; (43) Ind. 352; (44) Ohio 163; (50) 51.
- jointworm parasites, life history, (45) 460.
- jointworm, summary, (45) Mich. 251.
- judging, relation to baking tests of flour, (45) 61.
- Kanred, establishing in Kansas, (42) Kans. 36.
- Kanred, history and characteristics, (46) U.S.D.A. 136.
- kernel plumpness and protein content, (50) 438.
- kernel, ungerminated, nonprotein nitrogen in, (50) 712.
- kernel, vitamin B distribution in, (47) 860.
- Kota, description, (50) U.S.D.A. 33.

Wheat—Continued.

- Kota, studies, (48) N.Dak. 532.
 Kubanka durum, improvement, (50) U.S.D.A. 337.
 labor expense of production, (45) 85.
 Lachnosteria grub injury, (41) 166.
 large root systems, effect, (50) 525.
 leaf color, relation to yield and composition, (46) 35.
 leaf rust, life cycle, (45) Ind. 144.
 leaf rust, studies, (43) Ind. 345; (44) Kans. 242; (49) Ga. 541; (50) 546.
 lime v. chalk for, (46) 716; (48) 323.
 liming experiments, (41) Del. 136; (42) 218; (43) Can. 729; (45) Ohio 126; (46) 131, Md. 321.
 lodging in, (41) 636.
 lodging, mechanical resistance to, (48) 232.
 loose smut, notes, (43) 45; (44) 150; (50) 144.
 maggot, notes, (41) Mont. 57.
 manure utilization, as affected by time of liming, (44) 215.
 manuring experiments, (41) Idaho 225, Mo. 644; (43) Okla. 32, Utah 218; (45) Ohio 126; (48) N.Dak. 29; (49) Can. 734.
 market classes in Utah, (41) 434.
 marketing, cooperation in Kansas, (48) 891.
 marketing, farm storage as factor, (48) Kans. 687.
 marketing in Canada, (47) 693.
 Marquis, improved strain, (42) Wls. 337.
 Marquis, value, (44) U.S.D.A. 142.
 Mendelian characters, (44) 428.
 Michikoff, description, (49) Ind. 830.
 microflora of, (43) 445.
 middlings—
 analyses, (41) Conn.State 176, Can. 564, Ind. 564, R.I. 564, Ind. 868, N.Y.State 868; (42) 263, 560, Ind. 769, N.H. 769; (43) N.J. 69, Vt. 464, N.J. 672, R.I. 672, 867; (44) N.H. 671; (45) N.Y.State 469, N.J. 775, 872, R.I. 872, Vt. 872; (46) N.H. 675, 871; (47) N.Y.State 172, Mass. 274, 275, N.J. 571, R.I. 571; (48) 68, Me. 68, Can. 368.
 and red dog flour, (47) N.Y.State 172.
 as protein supplement for pigs, (49) Mich. 469.
 chlorin determination, (42) 506.
 composition and retail prices, Conn. State (44) 176; (45) 375; (47) 570.
 digestibility coefficients, (48) 574.
 standard fiber content, (47) 70.
 v. tankage, feeding value, (47) 76.
 midge, Moselle, notes, (47) 550.

Wheat—Continued.

- midge, notes, (43) Ind. 352; (44) Ohio 163; (46) Ohio 351; (50) 51.
 mill feeds, adulteration, (47) 70.
 mill feeds, manufacture, (47) Ind. 473.
 mill feeds, standards for, in Wisconsin (50) 573.
 mill products, composition, (44) 311.
 milling, (47) Tex. 69; (50) 806.
 milling—
 and baking tests, (41) Ariz. 333; (43) N.Dak. 642; (45) N.Dak. 225, N.Dak. 260, 636; (46) 634; (47) 337, Oreg. 534; (48) 136; (49) U.S.D.A. 825; (50) U.S. D.A. 738.
 and moisture content, (41) U.S. D.A. 169.
 and nutritive value, (41) 261.
 qualities, effect of tempering, (44) 662.
 yields as affected by humidity and moisture content, (46) U.S.D.A. 665.
 mixed feed—
 analyses, (41) N.H. 68, Conn. State 176, Ind. 564, R.I. 564; (42) Tex. 769, Mass. 866; (43) Ind. 69, N.J. 69, Ky. 373, Vt. 464, N.J. 672, 867, Ind. 867; (44) 267, Mich. 568, Mass. 671; (45) Tex. 68, N.Y.State 469, N.J. 775, 872, R.I. 872, Vt. 872; (46) Mich. 168, N.H. 675, Tex. 675, 871; (47) Mass. 274, 275; (48) 68, Me. 68.
 composition and retail prices, Conn.State (44) 176; (45) 375; (47) 570.
 definition, (47) Mass. 274.
 standards, (47) Tex. 70.
 moisture absorption, relation to humidity, (46) 731.
 moisture content for storage, (45) 636.
 mummy, studies, (46) 467.
 natural crosses in, (49) 36.
 nematode disease, notes, (42) 47, 448; (44) 49, U.S.D.A. 50, Va. 746.
 nematode galls, recognition, (42) 245.
 nematode infection, treatment, (41) 747.
 nematode, notes, (43) 751; (49) N.C. 747.
 new, for areas of limited rainfall, (49) 100.
 New Zealand grown, milling tests, (50) 438.
 nickel and cobalt in, (49) 520.
 nitrogen application, time of, (44) Calif. 724.
 nitrogen content, (43) Wash. 737; (44) 502; (49) 830.
 nitrogen fixation, atmospheric, by, (48) 725.
 Norwegian strains, tests, (45) 740.

Wheat—Continued.

- nutrient requirements, (43) Md. 121; (46) 716.
- nutrient solutions as affected by temperature, (46) 629.
- nutritive value of kernel and milling products, (41) 261.
- of ancient Egyptians, (42) 36.
- of Argentina, marketing, (48) 492.
- of Arizona, studies, (41) Ariz. 332.
- of Bihar and Orissa, classification, (49) 231.
- of North Dakota, milling qualities, (42) N.Dak. 492.
- of Ohio, milling and bread-baking values, (42) Ohio 340.
- of southeastern Russia, milling and baking tests, (50) 337.
- official grain standards for, (45) 90.
- on clover and timothy sod, (41) Idaho 225.
- Ophiobolus cariceti* on, (50) 145.
- orange leaf rust, aecial stage, (46) 144.
- origin, means of tracing, (47) 529.
- packing experiments, (49) U.S.D.A. 829.
- period of greatest nitrate utilization, (43) Ill. 215.
- phosphoric acid content, (44) 502.
- phosphorus requirements, (44) R.I. 32.
- photoperiodism, (48) 27.
- phytin content, (47) 366.
- Piricularia* on, (46) 448.
- plant, deficiencies, (42) Wis. 371.
- plant, monograph, (46) 837.
- planting dates, (42) Minn. 826.
- plants, metrical attributes, (47) 738.
- plat tests, technique, (41) 432.
- plowing tests, N.Dak. (44) 509; (45) 226.
- Polish, characteristics, (50) U.S.D.A. 33.
- pollination, (41) 441.
- position in American agriculture, (49) U.S.D.A. 389.
- possibilities in Kansas, (50) 533.
- poulard, characteristics, (50) U.S.D.A. 33.
- price regulation by Government, (43) 489.
- prices, (44) N.Dak. 386.
- prices and rainfall in western Europe, (47) 719.
- prices and world's supply, (43) 705.
- prices, forecasting, (49) 594.
- prices, guaranteed, and Grain Corporation, (43) 895.
- prices in Chicago for 81 years, (49) 693.
- prices of 1920 crop, (44) N.Dak. 361.
- problem, geography plan for sixth grade, (47) 397.
- production—
 - and duties in Great Britain, (41) 93.
 - and marketing, (48) U.S.D.A. 290.

Wheat—Continued.

- production—continued.
 - and movement, (44) 387.
 - and trade in Peru, (44) 530.
 - consumption, and trade, (41) 826, U.S.D.A. 891.
 - factors affecting, (45) Wash. 436.
 - future, in British Empire, (42) 439.
 - in Argentina, (45) U.S.D.A. 294.
 - in Brazil, (43) 292.
 - in Nebraska, effect of climate, (50) 715.
 - in New Zealand, (46) 788.
 - in northern Alaska, (50) 538.
 - in Peru, (46) 638.
 - in South Africa, (43) 393; (46) 441.
 - in Victoria, need for increasing, (43) 642.
 - in Yugoslavia, (48) U.S.D.A. 529.
 - intensive, in Tunis, (49) 736.
 - labor requirement, (49) 189.
 - on dry lands, (49) U.S.D.A. 828.
 - policies in France, (47) 297.
 - statistics, (46) 391.
 - trade, and foreign competition, (49) 794.
- productiveness and milling qualities, (46) Ohio 665.
- project study outlines, (44) 596.
- protection from birds, (45) 536.
- protection in Quebec, (43) 844.
- protein—
 - composition, factors affecting, (49) 821.
 - in, (43) Me. 641.
 - in, effect of summer fallow, (48) Calif. 526.
 - in, factors affecting, (44) 735; (47) 233, Idaho 636; (48) 529.
 - in, relation to hardness, (45) 636.
 - in, relation to variety types, (44) 142.
 - nutritive value, (42) 459, 755.
- proteins, biological value, (47) 765.
- purchasing power, (49) Nebr. 292.
- Pusa 12 and 4, characteristics, (46) 638.
- quality, effect of soil conditions, (49) Mich. 419.
- rate of manuring tests, Minn. (50) 120, 121.
- region of Canada, air streams in, (47) 16.
- relation of potassium to growth, (43) N.H. 29.
- residual effect of fertilizers on, (41) N.C. 625.
- resistance to Hessian fly, (49) 657.
- resistance to salt, (47) Calif. 620.
- respiration, effect of ether on, (41) 524.
- rôle in economic progress and international trade, (49) 94.

Wheat—Continued.

- root development, relation to tillering, (47) 636.
- root gall, notes, (44) 842.
- root system as affected by fertilizers, (46) 132.
- root system, development, (49) 521.
- rosette disease, control, (49) 343.
- rosette disease, varietal resistance, (50) 650.
- rosette, studies, (49) Ind. 538.
- rosette symptoms compared to diseases caused by insects, (49) U.S.D.A. 344.
- rotation experiments, (41) N.Y.Cornell 21, Kans. 32, Kans. 33, Del. 136, Ohio 136, N.Dak. 139, Idaho 226, 229, Mo. 644, N.Dak. 823, N.Dak. 824, Ill. 832; (42) 132, U.S.D.A. 336, Ohio 636, Minn. 731, Minn. 824; (43) Idaho 228, U.S.D.A. 435, 518, Ohio 726; (44) Kans. 213, Minn. 330, Del. 431, N.Dak. 524, Utah 525, 530, 632, Oreg. 827; (45) 35, Ohio 119, Ohio 126, Mo. 215, N.Dak. 216, Mont. 339, N.Dak. 734, 735; (46) 131, Ohio 334, Kans. 435, 436, 437; (47) Minn. 332, Alaska 527; (48) N.Dak. 224, 227, Minn. 321, Minn. 331, Minn. 332, 629, 630; (49) Oreg. 526, Ohio 725; (50) N.Y.State 422.
- rotation experiments with and without manure, (48) Calif. 526.
- Rubin, description, (47) 533.
- rust—
 - as affected by dry weather, (43) 652.
 - biologic forms, (44) Minn. 745.
 - control, (41) 544; (42) 742; (45) 445; (49) Mont. 146.
 - dissemination, (41) 50.
 - forms, (47) Ind. 147, 247.
 - history in Wisconsin, (42) 742.
 - in seed, relation to seedling infection, (43) 546.
 - in Wisconsin, (41) Wis. 842.
 - nature and control, (41) Can. 346.
 - notes, (41) 656, 747; (43) 45, 243, 347, 546; (44) 49, 446, 642; (47) 44, 348.
 - oversummering of, (44) 152.
 - relation to barberry, (42) 542; (43) 546; (44) Wis. 241.
 - relation to weather, (45) 542.
 - resistance, (47) 840.
 - resistance, breeding for, (41) Minn. 731; (45) 845.
 - resistance, genetics of, (44) 50.
 - resistance in crosses, (49) 841.
 - resistance tests, (46) 240.
 - resistant varieties, (41) Kans. 34, 535; (44) 539; (45) Ariz. 429, 542; (47) 222, Minn. 347; (49) Ind. 538.
 - strains, distribution, (48) Can. 450.
 - studies, (41) Kans. 48; (43) Iowa 654.

Wheat—Continued.

- rust—continued.
 - summer attacks, (50) 738.
 - varietal susceptibility, (45) 747
- rye ergot on, (46) 240.
- salt requirements, (46) 26.
- sawfly, black grain-stem, (43) U.S.D.A. 363.
- scab—
 - as affected by rotation, (42) 244.
 - as affected by temperature and light, (44) 540.
 - cause of corn root rot, (44) 541
 - conditions of growth, (49) Wis. 644.
 - control, (41) Iowa 245; (44) Wis. 241; (45) N.Dak. 242, Wis. 244.
 - (48) N.Dak. 44.
 - correlation to flower conditions, (47) Wis. 446.
 - development, (47) Wis. 445.
 - in Pennsylvania, (48) 242.
 - notes, (44) Conn.State 150; (46) 239, U.S.D.A. 240, Iowa 342.
 - organisms, biologic specialization, (45) N.Dak. 242.
 - organisms, production of conidia, (43) 545.
 - organisms, temperature relations, (44) Minn. 745.
 - relation to H-ion concentration, (50) 44.
 - studies, (45) Mo. 244; (47) 246; (48) Mo. 643.
 - varietal susceptibility, (46) Mo. 344.
- screenings, analyses, (41) N.Y.State 868; (43) Vt. 464, Ind. 867; (45) Tex. 68, N.Y.State 469, 872, R.I. 872.
- screenings for wintering lambs, (50) 574.
- seed—
 - as affected by heat, (41) 430.
 - bed, preparation, (41) Kans. 33; (44) Kans. 419, Utah 525; (45) Mo. 224, Nebr. 437.
 - color and rust resistance, (49) 840.
 - drying, (41) 730.
 - electrochemical treatment, (50) U.S.D.A. 738.
 - fertilizing before planting, (48) 529.
 - improvement, (47) N.C. 528.
 - infection, studies, (48) 46.
 - injury from drying after disinfection, (44) 540.
 - inspection, (41) N.Dak. 140.
 - standards, (47) 39.
 - treated, germination, (50) 740.
 - treatment, (41) 246, 737; (43) 642; (44) Mich. 153, Oreg. 841; (45) Wash. 242; (46) 449.
 - treatment with dry heat, (42) 644.
 - seeded on corn, effect of residual manure, (49) Mont. 130.

Wheat—Continued.

- seeding dates, temperature effect on, (41) U.S.D.A. 716.
- seeding experiments, (41) Kans. 34, N.J. 36, Nebr. 36, Iowa 227, 229, 535, Wash. 826; (43) Ind. 330, N.C. 434, Wash. 737, Minn. 823; (44) Ohio 141, Kans. 224, Minn. 330, Minn. 331, N.Dak. 524, Utah 525, 530, Minn. 732, Oreg. 826; (45) Ohio 126, N.Dak. 225, Wash. 436; (46) Kans. 435; (47) U.S.D.A. 330, Minn. 331, Minn. 332, Wis. 432, Oreg. 534; (48) Ohio 135, N.Dak. 225; (49) Can. 734, U.S.D.A. 828; (50) Minn. 132.
- seedling blight—
 - cause, (50) 648.
 - control, (45) Wis. 244.
 - factors affecting, (49) 345.
 - notes, (47) 246.
- seedling infection from rusted grains, (47) 543.
- seedlings—
 - absorption of sodium and calcium by, (41) 27.
 - as affected by iron compounds, (41) 430.
 - effect on pH of nutrient solutions, (49) 627.
 - growth as affected by colloidal substances, (41) 422.
 - growth as affected by H-ion concentration, (43) 525; (48) Del. 26.
 - infection with *Helminthosporium*, factors affecting, (50) 649.
 - sodium chlorid tolerance as affected by lime, (42) 626.
- seeds, factors affecting susceptibility to molds and fungicides, (45) 244.
- seeds, frosted and nonfrosted, physical properties, (48) 436.
- seeds, iron and manganese in, (49) 202.
- seeds, sprouted, vitamin content, (48) 826.
- selection experiments, (41) Mo. 637; (43) Me. 641.
- selection in New Zealand, (46) 731.
- selections and hybrids, (43) 528.
- self- and cross-fertilization, (42) 735.
- self-fertilization and hybridization, (48) 633.
- Septoria blight, notes, (43) 347.
- Septoria glume blotch, studies, (45) Ark. 445.
- Septoria leaf spot, (46) Iowa 342.
- Septoria, studies, (44) 539.
- Sevier, description, (50) 640.
- sheath worm, control, (47) 58.
- sheath-gall jointworm, control, (42) 752.
- shorts, analyses, (41) Can. 564, Ind. 868; (42) 560; (43) R.I. 672; (45) 872; (46) Tex. 675; (47) 275, 668.

Wheat—Continued.

- shorts, Canadian, composition, (41) 565.
- shorts, digestibility and productive value, (47) Tex. 472.
- shorts, standards, (47) Tex. 70.
- situation, (50) U.S.D.A. 389.
- situation in Northern Great Plains, (49) 596.
- smut—
 - as affected by soil fertility, (44) 539.
 - control, (42) 742; (44) 540, 747, Oreg. 841; (45) 49; (46) 546; (47) Calif. 647; (48) 242, Oreg. 243; (49) Wash.Col. 241, 245, Oreg. 538, Okla. 542, Idaho 746; (50) 649.
 - control in Northwest, (44) 152, 153.
 - effect of conditions at seeding time, (47) Idaho 749.
 - increase of resistance to, (49) 45.
 - infected, feeding value for fowls, (42) Calif. 872.
 - infection, relation to moisture, (49) Idaho 241.
 - infection through flower, (42) 244.
 - notes, (41) 843; (43) 243; (44) 49, Conn.State 150; (46) 239, 544.
 - prevention, (43) 347, 445; (44) Mich. 153.
 - resistance, inheritance of, (43) Wash. 737.
 - resistant varieties, (42) 47; (44) 152, 539, Oreg. 841; (49) Wash. Col. 223.
 - spore content, estimation, (49) 841.
- smut, stinking—
 - control, (42) 245; (44) 843; (45) 48, 445, 846; (46) Mich. 448, 546, 741, 742; (47) 45, 245, Wash. 648, Mich. 840; (48) Wash.Col. 452, Calif. 545; (49) 645, 841; (50) Calif. 43, 347, 348.
 - effect of soil moisture, (49) Idaho 745.
 - inheritance of resistance to, (44) 843.
 - notes, (41) 843; (43) 45; (46) 741.
 - prevention, (50) 245.
 - relation to soil moisture, Idaho (44) 539; (45) 240.
 - relation to spore load, (48) 243, 741.
 - resistance, genetics, (49) 244.
 - resistant varieties, (47) Oreg. 148.
 - spore germination, effect of chemicals, (47) 245.
 - studies, (47) Oreg. 148; (50) 245.

Wheat—Continued.

- smut, studies, (43) Wash. 749; (44) 343; (45) Wash. 242; (47) Wash. Col. 541.
- smut, value of soaking treatment, (48) 346.
- smutted, spike structure, (50) 237.
- soil and climate needs, (49) Ohio 737.
- soils as affected by green manure, (47) 25.
- soils of India, studies, (41) 811, 814.
- sooty mold, resistance, (47) Calif. 648.
- sowing dates, (44) Ohio 163.
- speculation in France, (45) 797.
- spelt factor, relation to rachis internode characters, (50) 228.
- speltoid form, crossed with wheats, (46) 333.
- speltoid variations in, (46) 442.
- spike, two sides, productivity, (50) 237.
- spring—
 - and winter crosses, (46) 632.
 - and winter growing habit, inheritance, (48) 835.
 - area, agricultural conditions in, (47) 296.
 - breeding experiments, (49) Oreg. 525.
 - certification in Germany, (50) 439.
 - culture experiments, (49) Oreg. 525, S.Dak. 635; (50) Can. 231, Alaska 532.
 - dockage in, character, (47) 233.
 - earliness and rustiness, (44) N.Dak. 637.
 - effect of preceding crop, (49) 231, Nebr. 527.
 - foreign material in, (48) U.S.D.A. 441.
 - hard red, description, (48) U.S.D.A. 231.
 - plowing dates, (49) U.S.D.A. 829.
 - production, (48) Wyo. 734.
 - protein content, factors affecting, (47) Calif. 625.
 - rotation experiments, (49) Oreg. 526.
 - rust resistant, producing, (50) 635.
 - seed, longevity of, (43) 832.
 - seeding experiments, (48) Minn. 331.
 - seeding rate, (44) Wash. 225.
 - use of stored water in soil, (49) U.S.D.A. 418.
 - use of water on Great Plains, (49) U.S.D.A. 134.
 - varieties, (47) Alaska 527; (49) Wis. 629.
 - varieties, characteristics, (50) 237.
 - varieties for Canada, (47) 823.

Wheat—Continued.

- spring—continued.
 - variety tests, (43) N.H. 34; (44) U.S.D.A. 141; (47) Mich. 129, Pa. 429, 824; (48) Minn. 331, Minn. 332; (49) Mont. 129, Mont. 130, Wash.Col. 224, 232, Alaska 426, N.Mex. 525, Oreg. 525, S.Dak. 635, Idaho 732, Can. 734; (50) Minn. 133, Mont. 133, Mont. 134, West. Wash. 134, Can. 533.
 - yields, (43) 829; (44) Wash. 225; (49) Mont. 130, Pa. 223, Ohio 733.
- standards for, (41) U.S.D.A. 636.
- standing, fired by lightning, (44) U.S.D.A. 121.
- starch, action of enzymes on, (41) 409.
- starch, microphotograph of, (48) 708.
- starch, raw, digestibility, (43) 365.
- State standards, (44) Mont. 143.
- statistics, (41) 826; (42) U.S.D.A. 731.
- stem maggot, studies, S.Dak. (44) 652; (47) 451; (49) 549.
- stem rust—
 - biologic forms, (44) Kans. 242; (48) Minn. 346, 645.
 - breeding for resistance, (48) 742.
 - cytological study, (49) 45.
 - effect of fertilizers on, (50) 549.
 - effect on different varieties, (48) Can. 450.
 - genetics of resistance, (45) N. Dak. 245.
 - in Canada, biologic forms, (48) 45.
 - notes, (48) N.Dak. 44.
 - overwintering, (48) Nebr. 45, Can. 450.
 - relation to barberry, (45) 747.
 - relation to grasses, (46) 449.
 - resistance, inheritance, (49) 840.
 - resistance, nature of, (47) Calif. 647.
 - resistant varieties, (48) Calif. 545.
 - resistant variety, (45) 747.
 - studies, (47) 543, 750; (50) Minn. 144.
- storage, air-tight, as preventive of heating, (42) 237.
- stored, insects affecting, (43) 253, 254.
- straw—
 - cellulose, digestibility, (45) 672.
 - effect of hydrolysis, (45) 774.
 - feeding value, (45) Kans. 267.
 - fertilizing value, (48) Minn. 322; (50) 121.
 - gas from, tests, (42) 685.
 - hydrolyzed, composition and feeding value, (49) 166.
 - production of gas from, (50) U.S. D.A. 387.
 - treated, nutritional value, (48) 568.

Wheat—Continued.

straw—continued.

use as fertilizer, (47) Minn. 124.

use of different amounts, (48) Minn. 322.

v. hay, feeding value, (46) 765.

strawworm, control, U.S.D.A. (42) 752; (49) 558.

strawworm, migration of, (42) 754.

strength of, (44) N.Dak. 357.

stripe disease, (44) 747.

stripe rust, studies, (49) Idaho 746.

subsoiling and packing experiments, (45) N.Dak. 212.

survey, (47) Pa. 429.

take-all—

cause, (46) 240; (50) 549.

control, (43) 347, Ill. 844; (45) 445.

description, (42) 244.

in New York State, (44) 343.

in United States, (41) U.S.D.A. 746.

in Virginia, (42) 644.

notes, (41) 842; (43) 243, Ind. 345; (44) 49, 244; (47) 247, Pa. 445, Ark. 748, 840; (50) 746.

popular account, (46) U.S.D.A. 145.

relation to green manure crops, (43) 152.

tempering, changes in, (44) 661.

tester, new, (44) 143.

tests by State testing mill, (49) 831.

threshing in the Punjab, (50) 88.

threshing, tractor costs, (41) 790.

tillage experiments, (44) Kans. 214; Oreg. 827; (45) N.Dak. 225; (49) Wash.Col. 224.

tillage methods, (48) N.Dak. 224.

tillering, effect of extent of root systems, (49) 530.

time for planting, (44) Mich. 195.

time of applying nitrate, (49) Ky. 525.

time of cutting tests, (47) 337.

tolerance for various salts, (47) 812.

topping to prevent lodging, (46) 232.

toxic limit of alkali for, (49) 513.

trade of United States, (49) 795.

trade with Canada, (44) U.S.D.A. 491.

transportation, (45) 493.

treated with formaldehyde, absorption and germination, (46) 241.

varietal nomenclature, (46) 829.

varietal resistance to disease and pH value of juice, (49) 245.

varieties, (41) U.S.D.A. 194; (43) N.C. 434, U.S.D.A. 637; (44) Kans. 224; (45) Wyo. 431, Wash. 436; (46) Mo. 327, Mich. 633; (47) Oreg. 534; (49) Ga. 524, Nebr. 732.

varieties—

acid and sugar in, (47) 222.

American, classification, (49) U.S.D.A. 634.

Wheat—Continued.

varieties—continued.

as hay crop, (44) Calif. 731.

baking strength, (46) Can. 163.

better, need of, (49) Ohio 738.

blooming time, (41) 441.

descriptions, (49) U.S.D.A. 825.

durum, (49) U.S.D.A. 37.

for seed in Poland, (50) 439.

Fusarium affecting, (49) 840.

hard, in Morocco, (50) 438.

identification, (49) 134.

in Argentina, (41) 645; (43) 437; (45) 536.

in Australia, (44) U.S.D.A. 39, 439.

in California, (44) 832.

in Netherlands, (44) 439.

in New South Wales, (45) 42; (50) 438.

in Oklahoma, (48) 136.

in Sahara oases, (43) 831; (45) 42.

in South Africa, nomenclature, (41) 534.

in Tunis, growth periods and drought, (49) 31.

in Utah, (41) 434.

new, (42) 137; (44) Mich. 195, 439.

new, description, (46) 531.

new in Italy, (50) 437.

resistant to Hessian fly, (45) Mo. 252; (49) Kans. 453.

species, (48) 835.

standardization, (46) Ohio 394.

studies, Del. (41) 39, 137.

susceptibility to Hessian fly injury, (41) Kans. 34.

Swedish, quality, (48) 135.

yields, (45) Wis. 132; (47) Minn. 129, Minn. 331, Wis. 432.

variety and strain tests, plat technique, (47) Mo. 329.

variety survey, key, (44) Utah 137.

variety tests, (41) Alaska 30, Alaska 31, Kans. 34, Idaho 225, Idaho 226, Nev. 227, 229, Ariz. 331, 334, Can. 528, 529, 535, Mo. 637, 638, N.C. 638, Minn. 731, N.Dak. 824, Wash. 826; (42) 132, 229, U.S.D.A. 336, U.S.D.A. 337, 399, 530, Wis. 533, Wash. 631, Minn. 731, N.Dak. 732, Ala.Col. 822, Minn. 824, Minn. 826; (43) Okla. 32, Md. 134, Wyo. 135, Nev. 228, 231, 232, N.Dak. 332, U.S. D.A. 435, 528, Minn. 636, Nebr. 637, Ariz. 733, Can. 735, Mo. 736, Wash. 737, Minn. 823, Ky. 824; (44) N. Dak. 30, R.I. 32, Ohio 141, U.S.D.A. 141, 142, Kans. 224, Wis. 226, Alaska 329, Minn. 330, Mont. 331, Del. 431, Iowa 432, U.S.D.A. 432, Alaska 521, Alaska 522, Alaska 523, Ariz. 524, N.Dak. 524, S.C. 525, Utah 525, 526, 527, 530, 632, 633, N.Dak. 637, Minn.

Wheat—Continued.

variety tests—continued.

732, Va. 732, 733, Oreg. 826; (45) 35, Ohio 126, Mo. 224, N.Dak. 225, Wis. 227, Md. 228, U.S.D.A. 530, Nebr. 531, 532, 631, 735, Can. 822, N.Dak. 831; (46) 131, 132, 227, Mont. 327, N.H. 328, Kans. 434, 436; 437, 633, 634, S.C. 725; (47) Minn. 130, Nev. 131, Wyo. 131, U.S.D.A. 330, Minn. 331, Minn. 332, Minn. 333, Alaska 527, Nebr. 735, Okla. 823; (48) N.Dak. 30, N.Dak. 31, Ga. Coastal Plain 128, U.S.D.A. 224, N. Dak. 225, Can. 227, P.R. 227, 434, Ariz. 434, Ga.Coastal Plain 628, Mo. 628, 629, 630, 730; (49) 31, Va. 134, 135, Pa. 223, 329, Kans. 427, Tex. 429, Wyo. 429, Ky. 525, U.S. D.A. 825; (50) 28, U.S.D.A. 132, Pa. 432, S.C. 637.

water requirements, (43) Colo. 185; (50) 734, 828.

water requirements, effect of rust infection, (50) 649.

weed control methods, (41) 737.

Week, National, at Paris, (50) 539.

weevils, oxygen requirements in sealed vessels, (43) 254.

weevils, studies, (41) 758; (43) 253.

weight of unit volumes, (45) 344.

white, in United States, (48) U.S.D.A. 835.

whitehead disease, notes, (41) 154.

whole, digestibility and productive value, (47) Tex. 472.

wild forms, synthetic production, (41) 338.

winter—

and spring crosses, (46) 632.

as affected by excessive amounts of fertilizer, (48) 520.

as affected by neutral phosphate, (49) 517.

as affected by weather conditions, (41) U.S.D.A. 810.

blossoming and fertilization, (42) 734.

breeding experiments, (49) Oreg. 525.

certification in Germany, (50) 439.

cold resistance, biochemistry, (50) Minn. 137.

composition, factors affecting, (48) 720.

culture, (45) N.Dak. 831; (48) U.S.D.A. 36; (50) N.Dak. 33.

culture experiments, (48) N.Dak. 225; (49) Mont. 129, Oreg. 525, S.Dak. 635; (50) Mont. 133, Alaska 532.

effect of preceding kafir crop, (45) 332.

fertilizer experiments, (43) Idaho 227.

Wheat—Continued.

winter—continued.

freshly harvested, germination tests, (42) 237.

hard red, characteristics and adaptations, (48) U.S.D.A. 231.

hardiness in, (48) 836.

important varieties, (49) Nebr. 527.

in Saskatchewan, culture, (47) 823.

irrigation experiments, (43) Nebr. 637.

natural crossing in, (50) 634.

new hardy variety, (46) 442.

plowing dates, (49) U.S.D.A. 829.

producing after various crops, (49) Wash.Col. 292.

production, (48) Wyo. 734.

progeny of speltoid mutation in, (49) 335.

resistance, (50) 231.

rotation experiments, (49) S.Dak. 635.

rust resistant varieties, (47) U.S.D.A. 446.

seed bed preparation, (46) Tex. 328.

seed treatment with Uspulun, (44) 153.

seeding date, (41) Iowa 227.

seeding experiments, (43) Minn. 823; (44) Iowa 432; (47) Wis. 432; (48) Minn. 331, Minn. 332; (49) Mont. 129, Idaho 732, Ohio 733, U.S.D.A. 829.

seeding, table of fly-free dates, (47) Mich. 761.

snow effect on growth, (43) 417.

soft red, areas, (48) U.S.D.A. 835.

tillage, (46) Nebr. 837.

time of planting, (47) Minn. 332.

varieties, (47) Alaska 527; (49) Wis. 629.

varieties, characteristics, (50) 237.

varieties for Canada, (47) 823.

varieties for eastern United States, (45) U.S.D.A. 133.

varieties, hardy and tender, (47) 38.

varieties in Sweden, (46) 730.

variety tests, (41) Del. 39; (44) Kans. 224, Iowa 432; (47) 824; (48) Minn. 331, Minn. 332; (49) Mont. 129, Mont. 130, Wash.Col. 224, 232, Alaska 426, Oreg. 525, S.Dak. 635, Idaho 732, Nebr. 733, Ohio 733, Can. 734; (50) Minn. 133, Mont. 133, Mont. 134, West.Wash. 134.

yield as affected by weather, U.S. D.A. (42) 321, 616.

yield, effect of crumb structure of soil, (49) 210.

yields, (44) Wash. 225; (47) Nebr. 735; (49) Mont. 130.

winterkilling, effect of soil cultivation, (49) Mont. 129.

Wheat—Continued.

- winterkilling, relation to fertilizers, (44) 626.
- winterkilling, studies, (42) 644.
- with addition of minerals, nutritive value, (49) Wash.Col. 265.
- world's production and consumption, (42) 439.
- world's supply and demand, (45) 294.
- yellow berry in, (42) 340; (49) Oreg. 541.
- yellow rust, studies, (44) 447; (46) 240; (47) 543.
- yield—
 - and climate at Maryland Station, (50) 641.
 - as affected by rainfall, (43) 208.
 - as affected by seeding rate, (46) Ohio 334.
 - cycles, (41) 892.
 - effect of moisture supply during spike formation, (49) 738.
 - from electrically treated seed, (44) 232.
 - from experiment fields, (45) Ill. 727.
 - in Australia, (43) 527; (46) 132.
 - in England during seven centuries, (50) 641.
 - in Greece, (47) 121.
 - in Manitoba, relation to weather, (42) 617.
 - in New Jersey, (46) 225.
 - relation to rainfall and temperature, (47) 115, 616.
 - relation to size of seed, (46) 442.
- yields, (44) N.Dak. 30, U.S.D.A. 228, Mont. 331; (46) Mont. 327; (47) Wash.Col. 528; (48) N.Dak. 30, 227, Calif. 527.
- Wheat-rye hybrids, (44) 736; (48) 334.
- Wheat-spelt hybrid, disease suppressing awns, (45) 747.
- Wheel slippage of tractors, data, (49) 791.
- Whey—
 - as grain supplement for pigs, (45) Wis. 270.
 - as milk substitute for calves, (44) 776.
 - butter, (42) 270; (46) 772.
 - butter, quality, (47) Wis. 481.
 - feeding value, (41) Mich. 74, 569, 572; (42) Calif. 871; (44) Wis. 268; (49) 72.
 - for pigs, pasteurization, (48) 176.
 - production, composition, and use, (49) 782.
 - propionic acid and ketones in, (50) 205.
 - sugar, use in candy making, (42) Wis. 316.
 - utilization, (41) 80; (49) 312; (50) 280.
- Whippoorwill from Porto Rico, description, (42) 249.
- Whipworms, treatment, (41) 480, 782.

- Whipworms, treatment, new method, (49) 788.
- White—
 - ants, *see* Termites.
 - fish, insects as food for, (49) 848.
- White flies—
 - control, (49) 654.
 - of hothouses, (48) Ky. 356.
 - of Jamaica, (50) 556.
- White fly—
 - citrus, destruction by lady beetles, (42) 455.
 - greenhouse, control, (47) 255.
 - greenhouse, on tomatoes, control, (46) 458.
 - new parasite of, (48) 358.
 - spiny citrus, notes, (41) 355, 660.
 - woolly, notes, (41) Fla. 548.
- White grubs—
 - breeding parasites of, (42) 755.
 - control, (48) Fla. 251; (49) 50, 549.
 - in Australia, (41) 666.
 - in Iowa, (41) Iowa 259.
 - in soil, remedy, (45) 258.
 - in sugar cane soils, (48) 254.
 - natural control, (45) 858.
 - notes, (44) N.J. 349.
 - on rubber, (46) 461.
 - on sugar cane, (41) 251; (43) 52; (46) 57, 250.
 - paper on, (50) Mich. 496.
 - parasites of, (48) 360.
 - soil insecticides for, (44) 852.
- White middlings, analyses, (41) Ind. 868.
- White pine—
 - aphid, infestation, (43) 556.
 - bark beetles, notes, (41) 758.
 - blister rust—
 - conference, international, (43) 755; (44) 451; (46) 850.
 - control, (41) 55, 350, 351, 352; (42) Conn.State 248; (43) 248, 658; (45) 442, 549, 753; (46) 49, 843; (47) U.S.D.A. 154, Conn. State 548; (48) Can. 150; (49) 150.
 - control in New York State, (45) 239.
 - dissemination by insects, (42) 153; (43) 754.
 - dissemination by wind, (42) 248.
 - distribution and viability of spores, (43) 249.
 - effect on Ribes, (50) 656.
 - gametophytic development, (48) 526.
 - growth and behavior, (46) 851.
 - identification and prevention, (43) 350.
 - in Colorado, (41) 351, 659.
 - in Europe, (50) U.S.D.A. 843.
 - in Michigan, (49) Mich. 446.
 - in Montana, (42) 747.
 - in New Hampshire, (42) 747.
 - in Quebec, (44) 54.

White pine—Continued.

blister rust—continued.

- in the West, (47) U.S.D.A. 653.
- in Wisconsin, (42) 747.
- infection, (50) 753.
- infection, distance of spread, (46) 150.
- inspection in Virginia, (42) 647.
- late production of aecia, (45) 451.
- laws and regulations, (41) U.S.D.A. 45.
- notes, (42) 46, 541; (44) 54, Conn.State 150, 156, 742; (46) 243, 844; (47) Pa. 445, Wash. Col. 541; (48) Can. 450; (49) 44.
- on Ribes, control, (43) N.H. 44.
- overwintering, (41) 158; (43) 849.
- prevention, (42) 643.
- quarantine, (48) 352.
- relation to Ribes, (44) 347.
- situation, (41) 158, 655, 659.
- spore germination, (50) 656.
- studies, (41) 351, 352, Can. 543, 655; (42) 51, Conn.State 247; (43) 249, 552, Can. 754; (48) 648.
- summary, (43) 248.
- surveys, (45) Can. 841.
- temperature of spore germination, N.H. (43) 842; (46) 343.
- work in Oregon, (46) 654.

- chemical injuries, (50) 753.
- culture in Minnesota, (44) 47.
- distribution and habits, (50) 344.
- early growth, (49) N.H. 341.
- forests in New England, management, (43) 149.
- germination, (50) 444.
- inclined-bearing tests, (44) 285.
- infected with blister rust, treatment, (45) U.S.D.A. 753.
- infection experiments, (42) Conn.State 247; (43) 250.
- insects affecting, (42) 158; (50) 153.
- lands of Great Lakes region, reforestation for, (47) 442.
- leaf blight, studies, (48) Can. 51.
- losses from weevil damage, (50) 57.
- marking rules, pathological, (41) 840.
- mycorrhizas on, (48) 725.
- needle blight, notes, (45) 549; (46) 454; (48) 248, 850; (50) 753.
- plantation, (47) Mich. 146.
- production, (49) 238.
- release in Harvard Forest, (47) 42.
- removal, effect on temperature and moisture, (48) 344.
- reproduction and thinning, (47) 146.
- root development, (48) 42.
- root habit, (41) 634.
- seed, collecting and storing, (45) 838.
- seed, germination tests, (48) 840.
- seedlings, effect of time of transplanting, (46) 142.

White pine—Continued.

- seedlings, fertilizer experiments, (50) 443.
- stands, yield, effect of thinning, (49) 42.
- summer planting, (43) 841.
- thinning experiments, (43) N.H. 42.
- weevil, notes, (43) Conn.State 251; (44) 742; (46) 254; (49) 761; (50) 57.
- weevil, summary, (44) Me. 166.
- western, rots of, (42) U.S.D.A. 248.
- western, wood analyses, (48) 415.
- White race in Tropics, metabolism, (46) 671.
- White scours—
 - and calf pneumonia, (50) Minn. 181.
 - eradication, (47) 285.
 - infectious, (44) Minn. 778.
 - of calves, prevention and cure, (43) 183.
- White spruce pulp digestion, sugar formation during, (48) 415.
- Whitewash preparation and use, (46) 688.
- Whitman, C. O., posthumous works, (43) 66.
- Whitten, J. C., biographical sketch, (47) 98.
- Whooping cough, course of disease as affected by diet, (45) 163.
- Wild ducks, food habits, (44) U.S.D.A. 547.
- Wild fowl, North American, life histories, (49) 756.
- Wild life—
 - in tree tops, treatise, (47) 356.
 - of Canada, conservation, treatise, (47) 356.
 - resources of Louisiana, (46) 554.
- Wilder medals for fruits, (47) 340.
- Willow—
 - black, size of root cells and vein islets, relation to age, (49) 424.
 - borer, notes, (45) 558.
 - borer, studies, (42) 454.
 - canker, control, (43) 350; (45) 46.
 - canker disease, notes, (49) 548.
 - diseases in England and Wales, (49) 645.
 - fence posts, treatment, (43) U.S.D.A. 391.
 - golden, culture experiments, (48) N. Dak. 239.
 - leaves and twigs, feeding value, (45) 774.
 - leaves, food value, (44) 866.
 - rust, control, (43) 350.
 - sawfly, notes, (46) 51.
 - scale in South Dakota, (41) 59.
- Willows—
 - as protection against drifting sand in drainage ditches, (49) Mich. 439.
 - as windbreaks, (44) N.Dak. 524.
 - basket, culture experiments, (41) Mo. 652.
 - basket, culture in Maryland, treatise, (42) 240.

Willows—Continued.

- basket, insect and fungus pests, (43) 556.
- basket, insects affecting, (43) 350.
- Bavarian, monograph, (44) 239.
- culture, (48) 447.
- culture, treatise, (41) 345.
- Cytospora chrysosperma* on, (46) 850.
- peach leaf, dioeciousness, (44) 428.
- pests, (42) 240.
- satin moth affecting, (44) 252; (45) U.S.D.A. 153.

- Wilson, Jas., biographical sketch, (43) 601.
- Wilsonia, new genus, erection, (41) 757.
- Wilt diseases, new, in Australia, (46) 44.
- Wilting of plants, (49) 521.

Wind—

- and distribution of pressure, (42) 117.
- and free-air pressure charts, (43) U.S.D.A. 718.
- as affected by vegetation, (48) 208.
- direction, effect on temperature, (43) U.S.D.A. 118.
- direction, effect on weather of Palestine, (50) 616.
- direction, relation to rainfall, (42) U.S.D.A. 320.
- distribution charts, notes, (44) U.S.D.A. 121.
- effect on distribution of soil organisms, (43) 842.
- effect on movement of insects, U.S.D.A. (43) 120, 157.
- effect on plant growth, (46) 827.
- function in fruit pollination, (46) 840.
- heat losses due to, (47) 488.
- in northern and middle Europe, (44) 508.
- increase marked by smoke arch, (44) U.S.D.A. 121.
- motors, possibilities and limitations, (42) 586.
- off-shore, and cold shore water, (43) U.S.D.A. 719.
- pressure in chimney design, (49) 388.
- relation to evaporation, (43) 16.
- rôle in dissemination of pathogenic organisms, (42) 215.
- tables, (41) 808.
- turbulence in a mountain valley, (43) U.S.D.A. 719.
- velocities, high free-air, notes, (42) U.S.D.A. 620.
- velocity and movement, (44) U.S.D.A. 716.

Windbreak trees—

- for California, (42) Calif. 838.
- for Minnesota, (42) Minn. 834; (45) 644; (48) Minn. 338.
- for North Dakota, (48) N.Dak. 239.
- on prairie farms, (43) 650.
- variety tests, (42) U.S.D.A. 343.

Windbreaks—

- effect, (45) 745, 809.
- for citrus groves, (44) 536; (45) P.R. 638.

Windbreaks—Continued.

- planting, (42) Mich. 347.
- value to crops, (44) 838.
- Windmill practice, modern, (49) 688.
- Windmill pumping, (49) 586.
- Windmills—
 - design, (46) 287.
 - improvement in, (47) 291.
 - tests, (45) 791.
 - use in South Dakota, (43) 620.
- Window shades, conductivity, tests, (42) 590.
- Windows for rural dwellings, (44) 189.
- Windows, heat transmission through, (44) 588.
- Winds—
 - hot, in United States, (49) 808.
 - paper on, (43) U.S.D.A. 119.
 - surface, and lower clouds, (44) U.S.D.A. 716.
 - surface, factors affecting, (45) 417.
- Windstorm of November 20, 1919, injury to citrus trees, (43) 41.
- Wine cellars, cooperative, in Italy, (47) 95.
- Wine making in France, (45) 742.
- Wine, production in Spain, (42) 140, 737.
- Wines—
 - analyses, (41) 836.
 - analysis, official method, (44) 9.
 - from berries, preparation, (41) 739.
 - red, spectroscopic titration, (42) 612.
- Winnipeg grain exchange, report, (47) 296.
- Winter injury of 1917-18, (44) Alaska 327.
- Winter injury, studies, (47) Nebr. 731; (48) Mo. 455.
- Winter injury to apple roots, (49) N.H. 327.
- Winter injury to orchards, (44) Oreg. 821.
- Winter, mild, of 1920-21 in Northern Europe, (45) U.S.D.A. 17.
- Winter of 1918-19 in United States, (41) 509.
- Winter temperature in western Europe, (44) 618.
- Winters—
 - sequence in northeastern United States, (45) U.S.D.A. 16.
 - severe, periodic return, (48) 614.
- Wire—
 - belts with paper driving surface, (43) 891.
 - fences, woven, construction, (44) 588.
 - grass or poverty grass, mechanical injury to livestock from, (49) 679.
 - rope, determining stresses, (41) 584.
 - rope, tests, (42) 387.
 - screen, durability test, Wyo. (43) 189; (45) 478.
- Wireworm—
 - false, biology, (50) 849.
 - false, life history, (41) 260.
 - infested soil, treatment, (41) N.J. 58.
 - on sugar cane, (47) 253.
 - relation to soils, (44) S.C. 59.

Wireworms—

- baits for, (41) 462.
- control, (42) 455; (47) Conn.State 155; (48) Fla. 251; (49) 761.
- false, on strawberry, (49) Ark. 554.
- false, studies, (49) Idaho 756.
- life history, (42) 855; (46) 462; (48) 460.
- notes, N.J. (44) 349; (48) 345.
- on cotton, (43) U.S.D.A. 352.
- Plains false, studies, (49) Nebr. 658.
- studies, (46) S.C. 747.
- toxicity of organic compounds to, (43) 854.

Wiring for light and power, treatise, (47) 391.

Wisconsin—

- Station, notes, (44) 700; (46) 97; (47) 100; (48) 300, 699; (49) 99, 300, 498; (50) 398, 799.
- Station, report, (42) 397.
- Station, report of director, (44) 297; (45) 299; (47) 497; (49) 696.
- University, history of, (45) 397.
- University, notes, (43) 600, 800; (44) 700; (46) 97, 199, 499, 700; (47) 100; (48) 300, 699; (49) 99, 300, 498; (50) 398, 799.
- Veterinary Medical Association, (47) 283.

Witches' broom on pears, (42) 49.

Witches' broom, studies, (43) 821.

Woburn Experimental Fruit Farm—

- editorial on, (42) 104.
- notes, (42) 98.
- report, (42) 233; (43) 29.

Wohlfahrtia vigil—

- as human parasite, (48) 157.
- nonhuman host records, (49) 760.

Wojnowicia graminis, notes, (49) Kans. 443; (50) 145.

Wolf, gray, of South Dakota, destruction. (42) 545.

Wolves, destruction, (48) 456.

Woman farmer, handbook for, (41) 492.

Woman's Committee of Council of National Defense, (44) 260.

Women—

- basal metabolism, (41) 760; (46) 166.
- calcium and magnesium metabolism, (48) 861.
- digestion experiments, (47) 166.
- farm, improved conditions for, (44) 192.
- farm, labor saving for, (43) U.S.D.A. 894; (44) U.S.D.A. 490, 491.
- Government employees, provision for, (42) 863.
- in agriculture in Scotland, (44) 893; (45) 492.
- metabolism during light household work, (42) 167.
- on the farm, (42) 490.
- on the farm, bibliographies, (41) 492, 592.

Women—Continued.

- place in unified extension program, (49) 492.
- training for extension work, (49) 492.
- training for health work in nutrition, (45) 61.
- underweight college, metabolism and food consumption, (48) 160.
- vocational education for, (45) 94.
- workers, energy expenditure and food requirements, (41) 761, 856.
- workers in agriculture in Bavaria, (42) 288.
- workers in agriculture in England and Wales, (41) 293; (42) 895; (44) 789.
- workers in beet fields, (49) 796.

Women's—

- colleges, home economics instruction in, (42) 293.
- Farm and Garden Association, small-holdings colony, (47) 796.
- institute organizers, school for, (44) 598.
- Institutes, Federation, organization, (46) 792.
- institutes in Canada, (42) 196, 693; (43) 395; (44) 598.
- institutes in Ontario, (46) 696; (48) 97.

Wood—*see also* Timber and Lumber.

- acid hydrolysis, effect of salts, (47) 713.
- action on photographic plates, (48) 730.
- American, analysis of heartwood and sapwood, (50) 712.
- anatomy and water conductivity, (41) 328.
- as source of alcohol, (43) 617.
- ashes—
 - analyses, R.I. (42) 526; (44) 423; (46) 221.
 - as source of potash, (42) 522; (43) 324.
 - effect on soil reaction, (48) 216.
 - fertilizing value, (46) 818.
 - potash determination in, (44) 804.
 - with cow manure, fertilizing value, (49) 516.
- block pavement, wearing qualities, (46) 780.
- block pavement, studies, (41) 790.
- borer in New Zealand, (41) 555.
- borers, breeding cages, (45) 657.
- boring beetles, control, (41) 847.
- "built-up," (42) 241.
- cellulose—
 - acetolysis reaction, (50) 509.
 - and cotton cellulose, comparison, (47) 809.
 - determination in, (42) 614.
 - hydrolysis products, (50) 9.
 - nature of, (50) 206.
- charcoal, (41) 449.
- charcoal, manufacture, (45) 443.

Wood—Continued.

- charred, nature of, (41) 526.
- chemistry of, (43) 617; (48) 415, 416; (50) 712.
- coniferous, penetration by preservatives, (41) 819.
- coniferous, proximate analysis, (43) 506.
- conservation and impregnation, (47) 89.
- conservation and improvement, treatise, (49) 83.
- conservation, fundamental principles in, (45) 390.
- decay by *Polyporus pargamentus*, (43) 553.
- decay, effect of bacteria, (44) 26.
- decay, studies, (42) 224; (48) 352, 353.
- destroying fungi—
 - effect of heat, (50) 754.
 - introduction into United States, (41) 746.
 - little-known hosts, (48) 851.
 - studies, (41) 453.
 - toxicity of zinc chlorid to, (49) 447.
- dicotyledonous, intercellular canals in, (45) 46.
- dicotyledonous, structure, (41) 344.
- distillation—
 - chemistry of, (43) 409.
 - effect of chemicals, (47) 208.
 - products, methoxyl in, (48) 416; (50) 206.
 - treatise, (50) 587.
- distribution of chemical constants, (43) 506.
- drying, internal stresses, (43) 590, 591.
- fiber, measurements, (45) 745.
- fibers, identification in paper pulp, (50) 509.
- fibers, thermal conductivity, (49) 186.
- figure in, (46) 143.
- for butter boxes, (50) Calif. 782.
- for fence posts, tests, (44) 87.
- for the Nation, (45) U.S.D.A. 744.
- French colonial, properties, (50) 647.
- fuel—source, (49) 239.
- treatise, (41) 449.
 - value, (46) Mich. 542; (48) 783.
- green, control of sap stain, mold, and decay in, (47) U.S.D.A. 755.
- in silo construction, (46) Mich. 598.
- industries of Sweden, (45) 540.
- infection and decay, changes during, (47) 208.
- infection, studies, (42) 51.
- kiln drying, (49) U.S.D.A. 386.
- kiln drying, boxing, and gluing, demonstration courses in, (50) U.S.D.A. 41.
- lice, notes, (50) 255.
- lots, care, (44) U.S.D.A. 443.
- lots for shelter, (47) Tex. 439.

Wood—Continued.

- meal, hydrolyzed, utilization, (44) 71.
- moisture resistant coatings for, (49) 385.
- morphology in relation to brashness, (45) 46.
- of Philippine dipterocarps, anatomical features and properties, (49) 143.
- of stumps, distillation, (43) 888.
- of trees, spread of moisture in graft region, (44) 341.
- oil adulterated with bean oil, (44) 805.
- oil, production and manufacture, (42) 840.
- paint protection for, (47) 687.
- penetrating alga, (41) 429.
- penetration of molds in, (50) 656.
- pipe, history and use, (47) 288.
- poles, preservative treatment, (41) 686.
- poles, supporting rural electric lines. creosoting, (49) 485.
- polishing and staining, treatise, (48) 784.
- powder-post damage to, (45) 891.
- preservation—
 - against termites, (45) 657.
 - chemistry of, (43) 409.
 - methods, (42) 580.
 - notes, (42) 85, 782.
 - relation to penetrance of oil, (43) 283.
 - with low temperature creosotes, (50) 485.
- preservatives against termites, (47) 360.
- preservatives used in United States, (47) 290.
- production in East Africa, (44) 594.
- proximate analysis, (41) 14.
- pulp—
 - and pulpwood in North America, treatise, (50) 545.
 - attacked by molds, (48) 150.
 - cellulose as emergency feed, (43) 170.
 - cellulose, nitrating, (41) 14; (42) 116.
 - determining bleach requirement, (50) 715.
 - production and consumption, survey, (42) 840.
 - production, statistics, U.S.D.A. (42) 144; (50) 41.
 - resources of Tongass National Forest, (45) U.S.D.A. 350.
 - storage in water, (50) 754.
 - use in war bread, (42) 363.
- pulping, sulphite process, modification, (46) 808.
- pyinma, ajhar, or jarul, notes, (44) 149.
- quantity treated in United States, (47) 290.
- rat, notes, (42) 748.

Wood—Continued.

- rats, bushy-tailed, of California, (42) 355.
 - relative durability, (50) U.S.D.A. 887.
 - roofs, decaying, preservation, (48) 288.
 - rot, prevention, (45) 754; (49) Oreg. 539.
 - sap stain fungi in, (48) 649.
 - spore germination of fungi in, (44) 55.
 - staining fungi, notes, (49) 250.
 - strength and shrinkage, relation to specific gravity, (41) U.S.D.A. 484.
 - strength, effect of zinc chlorid, (47) 289.
 - strength, seasoning, and grading, (42) 280.
 - structure, (50) 344.
 - structure of trees of India, (47) 539.
 - substitutes in Germany, (43) 204.
 - susceptibility to borer attack, (46) 252.
 - technical properties, treatise, (45) 83.
 - textbook, (46) 779.
 - ticks, cause of paralysis in children, (46) 59.
 - turpentine, specifications, (44) U.S.D.A. 207.
 - use as reinforcement for concrete, (42) 586.
 - use in agricultural implements, (42) 840.
 - use in apiculture, (44) 356.
 - used in aircraft construction, defects, (49) U.S.D.A. 351.
 - using industries of Maryland, (42) 242.
 - using industries of New York, (46) 739.
 - vessels, function of, (41) 726.
 - warblers, American, name of, (41) 548.
 - waste as source of potash, (41) 518.
 - waste, ethyl alcohol manufacture from, (45) 15; (47) U.S.D.A. 113.
 - waste, utilization, (45) U.S.D.A. 746; (46) 114.
 - waste, utilization, treatise, (44) 687.
 - water resistant end coatings for, (49) 791.
 - white-ant-proof, for Tropics, (47) 53.
- Woodbine, leafhoppers affecting, (47) 54.
- Woodland—
- and prairie, ecotone between, studies, (45) 221.
 - industries around Oxford, (46) 788.
 - products, cooperative marketing, (43) U.S.D.A. 345.

Woodlands—

- British, species for, (42) 739.
- English, management, treatise, (43) 442.
- farm, and the war, (41) U.S.D.A. 651.
- farm, forestry on, (44) U.S.D.A. 94.
- farm, in east Texas, development, (44) 838.
- farm, in Southern States, (42) U.S.D.A. 738.

Woodlands—Continued.

- farm, management, (41) 339; (43) 543.
 - of Indiana, management, (49) 341.
 - starting and care in New York, (41) 839.
 - stratification and H-ion concentration of soils, (49) 417.
- Woodlot, farm, as sugar bush, (47) Mich. 147.
- Woodlot products, marketing, (50) Mich. 444.
- Woodlots, care and improvement, (43) 840.
- Woodpecker, green, food habits, (41) 454.
- Woods—
- American, pulp and paper value, (43) 650.
 - analysis, methods, (42) 7.
 - Australian, physical properties, (50) 587.
 - called cedar, (42) 44.
 - cellulose determination in, (44) 312.
 - coniferous, durability tests, (48) 352.
 - coniferous, soda and sulphate pulps from, (46) 617.
 - dicotyledonous, storied structure of, (43) 225.
 - distillation of charcoal and tar, (42) 44.
 - distinguishing, (47) 443.
 - Formosan, characters and identification, (46) 143.
 - French Colonial, commerce and use, (44) 148.
 - identification, (46) 542, 843.
 - in South Africa suitable for matches, (46) 237.
 - Indian, for hammer handles, (47) 289.
 - inferior, in Trinidad, durability tests, (43) 44.
 - Japanese, characters and identification, (46) 143.
 - light-weight, source and characters (48) 345.
 - mechanical tests for, (42) 240.
 - moist, fungus insect fauna, (48) 153.
 - of California, analyses, (41) 14.
 - of forest of Analamazaotra, treatise. (49) 440.
 - of French colonies, (41) 150, 743.
 - of Hertfordshire, (43) 241.
 - of Java, (43) 443.
 - of Java, micrography, (41) 244.
 - of Malay Peninsula, (47) 42.
 - of South Africa, seasoning, (47) 389.
 - of the world, bibliography, (46) 737; (49) 440.
 - of Tonkin, inventory, (42) 642.
 - of United States, manual and bibliographies, (43) 443.
 - of United States, ray volumes. (47) 345.
 - Philippine, tests, (46) 283.
 - poisonous, (47) 443.

Woody aster—

- poisonous to sheep, (43) Wyo. 782.
- toxic substance, (43) Wyo. 782.

Woody plants—

- gummosis, (41) Ga. 49.
- keys, (49) 426.
- migration of nitrogen-free reserve materials, (44) 132.
- of Bombay, morphology and ecology, (41) 244.
- pocket guide, (47) 643.
- sprouting as affected by external factors, (43) 130.
- upward translocation of foods, (44) 323.

Wool—

- as affected by dips, (43) Wyo. 172.
- as affected by thyroidectomy, (46) 72.
- bacterial disintegration, (47) 868.
- clip, classification, (50) 690.
- clip, improvement, (44) Mich. 195.
- clip of South Australia, (45) 173.
- combing, treatise, (46) 72.
- cooperative marketing, (42) Mich. 694.
- cooperative sales, (43) N.C. 595.
- effect of alkali and weathering, (47) Wyo. 867.
- farm-flock, preparing for market, (43) Wash. 397.
- fiber as affected by humidity, (43) 571.
- fineness, determining, (47) 75.
- grading, principles, (48) 270.
- grease and dirt determination in, (48) U.S.D.A. 70.
- growth, manufacture and properties, (44) 393.
- in warehouses, injury from *Anthrenus*, (47) 258.
- industry in—
 - South Africa, (41) 772.
 - Union of South Africa, (46) 873.
 - Victoria, further development, (42) 593.
- international trade, (46) 675.
- Karakul curl, method of inheritance, (46) 270.
- Karakul, production in Canada, (43) 69.
- Kentucky, plan for marketing, (43) 673.
- loss on scouring, (48) Can. 372.
- maggot, summary of information, (45) Tex. 455.
- marketing, cooperative, in Missouri, (47) 296.
- marketing through regional pools, (47) 296.
- of Leicester-Merino crosses, properties and inheritance, (48) 767.
- production—
 - and commerce in, statistics, (48) 475.
 - and prices, (43) U.S.D.A. 695.
 - and trade, statistics, (45) 69.
 - and trade, summaries, (42) 770.
 - in Africa, (44) 365.

Wool—Continued.

- production—continued.
 - in Australia and New Zealand, treatise, (44) 268.
 - related factors in, (45) 376.
- quality—
 - and character, (50) 369.
 - as affected by crossing of sheep breeds, (48) 372.
 - station projects, (46) 609.
 - resources of British Empire, (46) 391.
 - review, annual, (45) 69; (47) 670.
 - review, annual, of Australia, (48) 70; (50) 369.
 - rôle in economic progress and international trade, (49) 94.
 - score card for, (46) 677.
 - scouring wastes, fertilizing value, (47) 324.
 - shrinkage, determination, (47) 670.
 - study, significance and fundamentals, (44) 869.
 - trade of Australasia, statistics, (42) 770.
 - trade of British Empire, (42) 870.
 - trade of England, survey, (49) 191.
 - trade of India, (43) 269.
 - unwashed, regain, (47) Wyo. 867.
 - virgin and shoddy, differentiating, (49) 412.
 - warehouses, regulations, (43) U.S.D.A. 571.
 - waste as source of potash, (41) 518.
 - yearbook, (47) 670.
 - yield, effect of age and individuality, (49) 871.
 - yield, factors affecting, (48) 399.
- Woolly aphid, *see* *Aphis*, woolly, and *Apple* aphid, woolly.
- Woolly bear caterpillar, notes, (48) 54.
- Work—
 - physical, blood and urine changes during, (41) 860.
 - physical, metabolism during, (41) 761, 856.
 - technical, metabolism per calorie, (41) 563.
- World's Dairy Congress, *see* Dairy Congress.
- World's Poultry Congress—
 - announcement, (49) 200.
 - notes, (44) 499; (50) 900.
- Worm—
 - eggs, detection in animal feces, (49) 785.
 - infection of pigs, treatment, (43) 467.
 - infestations, treatment, (41) 286, 480, 782.
 - nodular, and lesions in sheep, (45) 182.
- Worms—
 - and insects, parasitic relations, (50) 51.
 - parasitic, in man, diagnosis, (45) 655.
 - parasitic, relation to public health, (48) 550.
- Wormwood oil, yield and composition, (45) 802.

Wound—

calluses and bacterial tumors, (42) 435.

reactions in plants, studies, (42) 229.
shock, nature and cause, (47) 482.

Wounds—

anaerobic infection of, (41) 476, 874, 876; (45) 579.

bacteriology of, (43) 880.

healing as affected by diet, (41) 471.

Proteus vulgaris infections, (41) 84.

treatment, (41) 83, 187, 188, 376, 475, 577, 876; (42) 272.

treatment with flavin, (43) 79.

Wrack, use in potato culture, (48) 531.

Wrens of genus *Nannus*, (42) 847.

Wyoming—

Station, notes, (41) 199, 399; (42) 94, 499; (43) 200, 800; (44) 497; (45) 200, 600; (46) 199; (47) 400, 499, 700; (48) 700; (49) 499.

Station, report, (41) 397; (43) 197; (45) 497; (47) 196; (49) 495.

University, notes, (41) 199, 399; (42) 499; (43) 200; (45) 200, 600; (46) 199; (47) 400, 499, 700; (48) 700; (49) 499.

Xanthin, oxidation by tissues and milk, (48) 207.

Xanthoencyrtus fullawayi, notes, (43) 662.

Xanthomyia, new genus, erection, (50) 457.

Xanthonia villosula injurious to forest trees, (42) 252.

Xanthopastis timais, studies, (42) 652.

Xanthophyll—

content of poultry feeds, (44) 71.

differentiation from other pigments, (45) 64.

formation, (44) 629.

in leaves, (43) 633.

rôle in sugar production in plants, (42) 527, 627.

Xanthosoma hastifolium, use for greens, (42) 137.

Xanthosomas, culture experiments, (44) 433.

Xenia in chestnut, (45) 629.

Xenopharynx, genus, emendment, (49) 499.

Xenopsylla cheopis, notes, (50) 55.

Xerophthalmia—

and vitamin A, relation, (43) 860; (46) 760.

cause, (42) 59.

development, effect of light and darkness, (50) 61.

in Denmark, (50) 772.

in fowls, (45) 669.

in infants, (45) 668.

in rats, studies, (44) 263.

notes, (44) 361.

production and cure, (47) 862.

production in rabbits, (43) 369.

Xerophytism, origin, (45) 335, 524.

Xestobium rufovillosum, life history and control, (44) 658.

Xiphophorus helleri, sex differentiation in, (50) 331.

X-rays, see Roentgen rays.

Xylaria—

hypoxylon constituents, comparative utilization, (46) 723.

radicata, notes, (47) 547.

sp., control, (44) Va. 746.

sp., notes, (45) 843.

sp. on apple seedlings, (50) 750.

spp., studies, (42) Va. 447.

Xylarias, comparative studies, (42) 147.

Xyleborinus pecanis on sweet potatoes, (43) 163.

Xyleborus—

cofeicola n.sp., description, (48) 856.

destruens, studies, (42) 56.

dispar, notes, (44) Oreg. 850.

fornicatus, notes, (41) 359, 463; (44) 851.

fornicatus, summary, (50) 454.

sp., notes, (42) 152; (45) V.I. 150.

Xylena spp., studies, (41) 357.

Xylenol blue, proposed use as indicator, (47) 609.

s-Xylidine, synthesis, (44) 309.

Xylobiops spp., notes, (45) U.S.D.A. 258.

Xylococcus alni, studies, (41) 664.

Xylocrius cribratus, notes, (49) Oreg. 555.

Xylocrius spp., notes, (44) Oreg. 850.

Xylomiges sunia, control, (49) V.I. 352.

Xylose—

acid fermentation, (41) 614.

fermentation by molds, (48) 203.

fermentation, number of bacteria in relation to acid production, (45) 220.

fermentation products, (45) 9.

from corn cobs, (41) 117.

Xylostodoris luteolus, notes, (47) 553.

Xylotrechus colonus, notes, (45) 662.

Xylotrechus oblitteratus, notes, (44) 355.

Yam—

bean, notes, (48) Guam 228.

bean tubers, starch from, (48) 630.

disease, notes, (41) 749.

meal, preparation, (41) 65.

rot, notes, (43) 151.

weevil notes, (43) 258.

Yams—

acreage and planting time, (44) P.R. 433.

African, culture, (42) 439.

culture, (44) 827; (45) P.R. 234.

culture and use in Fiji, (43) 829.

culture experiments, (41) 825, 832; (42) 436; (44) 433; (50) 828.

culture in Philippines, (45) 235.

fertilizer experiments, (42) 436; (45) P.R. 234.

fungus attacking, (43) 652.

improvement, (45) 228.

in Gulf region, culture, (49) U.S.D.A. 738.

insects affecting, (47) 551.

lesser, yields in Singapore, (42) 439.

Yams—Continued.

- notes, (41) 825.
- staked v. unstaked, (48) P.R. 227.
- variety tests, (42) 436; (44) 827; (45) 34; (46) 226; (50) 28, 828.

Yarns, diameter, (48) 733.

Yarns, tensile strength, effects of water-proofing and weather exposure, (49) 386.

Yautias—

- acreage and planting time, (44) P.R. 433.
- culture directions, (45) 35.
- improvement, (45) 228.
- spacing experiments, (50) P.R. 533.

Yearbook of United States Department of Agriculture, (41) 698; (43) 496; (45) 799; (48) 297; (49) 395.

Yearbooks of United States Department of Agriculture, index, (47) 599.

Yeast—

- active constituent, nature, (47) 768.
- activity as affected by concentration of sugar solutions, (42) 627.
- activity as affected by flour extraction and admixture, (41) 362.
- analyses, (42) 263.
- and molds in butter, (48) 80.
- and vinegar dried grains, inspection and analyses, (42) Mich. 63.
- and yeast foam for pigs, (49) Iowa 774.
- as affected by ultra-violet rays, (44) 16.
- as growth stimulant for infants, (46) 759.
- as source of vitamin B for growth, (48) 759, 760.
- autolyzed, effect of growth of excised corn root tips in dark, (49) 627.
- autolyzed, in culture media, (41) 83.
- autolyzed, vitamin in, (44) 861.
- autoxidizable constituent, (46) 110.
- behavior towards arsenic, (44) 78.
- bios requirement, (49) 856.
- brewery and mineral, digestibility, (43) 367.
- cells, catalase action in, (41) 409.
- cells, catalase action in, strengthening, (42) 204.
- chemical, composition, (43) 415.
- culture experiments, (42) 204.
- culture in purified nutrients, (45) 366, 866.
- deficiency in rations of pigeons, effect, (46) 570.
- dietary properties, (50) 768.
- dried, energy value, (47) 69.
- dried, feeding value, (44) 867.
- effect on—
 - calcium assimilation, (48) 736.
 - keeping quality of butter, (50) 476.
 - magnesium and phosphorus assimilation, (48) 861.
 - polyneuritis, (46) 470.

Yeast—Continued.

effect on—continued.

- spoilage of butter, (47) 784.
- utilization of food, (45) 264.
- enzymes, (44) 133.
- enzymes, effect of yeast extract on, (46) 759.
- extracts, alcoholic, for polyneuritis, (46) 569.
- extracts, effect on muscle of frogs, (48) 557.
- feeding experiments with rats, (42) 167.
- fermentation, factors affecting, (45) 364.
- fermentation of plant nectar by, (43) 730.
- fresh, extracts for culture media, (42) 708.
- grains, dried, analyses, (41) N.Y.State 868; (42) Mass. 866; (43) N.J. 69, N.J. 672, 867; (44) Mass. 671; (45) N.Y.State 469.
- grown in vitamin-free media, composition, (48) 259.
- growth—
 - beet pulp press juice for, (45) 616.
 - nutritional factors in, (48) 558.
 - nutritional requirements, (45) 565, 765; (47) 266, 366.
 - on synthetic media, (50) 769, 853.
 - promoting stimulus, relation to vitamins, (44) 171.
 - promoting substance, ultimate source of, (49) 460.
 - rate and fermentation, (42) 204.
 - stimulant, action, (47) 565.
 - stimulant and vitamin B, (50) 363.
 - stimulation by organic nitrogen, (47) 62.
- in bread, nutritive value, (46) 759.
- in creamery butter, (44) 874.
- in diet, antirachitic value, (46) 473.
- in sweetened condensed milk, (48) 577.
- in tomato products, counting, (44) 12.
- lactose-fermenting, producing foamy cream, (42) 774.
- lactose-fermenting, studies, (45) Iowa 176.
- laxative action, (49) 459.
- nitrogenous constituents, (41) 802.
- nutritive value, (41) 65, 169, 263, 465; (50) 561.
- parasitic on Lima beans, (50) 650.
- pink, cause of spoilage in oysters, (42) U.S.D.A. 860; (43) 663.
- polyvalent, for alcohol production, (41) 508.
- preparations, listing, (47) 266.
- production of pink sauerkraut by, (47) 113.
- sensitiveness to hydrogen- and hydroxyl-ion concentration, (42) 204.

Yeast—Continued.

- silver vitamin compound from, (45) 612.
- studies, (50) 362.
- substitutes in Germany, (43) 204.
- therapeutic value, (41) 778; (47) 266.
- therapy and uric acid excretion, (48) 163.
- therapy failure in infants, (48) 656.
- use as test for vitamin B, (44) 561.
- utilization by animal organism, (43) 64.
- vitamin A in, (44) 560.
- vitamin and coenzym, differentiation, (46) 309.
- vitamin B in, (49) 562.
- vitamin extraction from, (50) 506.
- vitamin in, relation to culture media, (47) 168.
- vitamin requirements, (41) 670; (42) 59; (46) 759.
- water-soluble vitamin in, (42) 314.
- zinc in, (41) 464.
- Yeasts and Azotobacter, comparison, (41) Tenn. 430.
- Yellow AB and OB, estimation, (44) 312.
- Yellow bunting, food habits, (41) 454.
- Yellow fever mosquito—*see also* Aedes and Stegomyia.
 - and dengue fever, (49) 657.
 - control of breeding, (44) 256.
 - notes, (48) 751; (50) U.S.D.A. 53.
- Yellow fever, studies, (41) 851.
- Yellow leaf disease, cause, (48) 348.
- Yellow mice, factors for color, (41) 175.
- Yellow rattle—
 - control, (46) 727.
 - eradication, (44) 227.
- Yellow throat, nest life, studies, (41) 753.
- Yellowstone National Park, trees and flowers of, (50) 645.
- Yemané, regeneration experiments, (42) 142.
- Yerba manza, poisonous to livestock, (44) 180.
- Yerba maté—
 - adulteration, detection, (42) 112.
 - production in Argentina, (43) 745.
 - tea, nature and uses, summary, (42) 58.
- Yew berry, adulterant for marmalades, (42) 415.
- Yew disease, obscure, (46) 741.
- Yew, evolution of vacuolar system in, (44) 822.
- Yogurt—
 - plants and kefir grains, bacteriological studies, (45) 380.
 - preparation, directions, (42) U.S.D.A. 363.
- Ypsolophus marginellus, notes, (46) 750.
- Yucca—
 - elata, analyses, (41) Ariz. 367.
 - elata, digestibility and feeding value, (48) N.Mex. 266.

Yucca—Continued.

- glauca, feeding value, (42) Tex. 369.
- use in feeding, (41) Tex. 70.
- Yuma project experiment farm, report, (43) U.S.D.A. 397.
- Zagrammosoma multilineata, notes, (47) 852.
- Zagryphus n.g. and n.spp., descriptions, (42) 362.
- Zamia as food substitute, (46) 755.
- Zamia starch situation, (46) 308.
- Zatropis sp., notes, (48) 58.
- Zatropis tortricidis n.sp., description, (46) 254.
- Zea antiqua n.sp., description, (41) 530.
- Zea, direct origin of, (43) 222.
- Zea mays, *see* Corn.
- Zea mays polysperma, new variety, (45) 32.
- Zebra hybrids as domestic animals, (42) 375.
- Zebu cattle of Morocco, tests, (41) 368.
- Zebus and cattle, crossing, (45) 470.
- Zebus, disadvantages, (42) 371.
- Zebus in Madagascar, (42) 669.
- Zein, hydrolysis products, analyses, (50) 611.
- Zeie sp., parasitism by, (46) 247.
- Zelkova serrata, notes, (42) Calif. 838.
- Zenillia roseanae, studies, (46) 57.
- Zenodosus sanguineus larva, notes, (46) 857.
- Zeolites, effect on nitrification, (45) 726.
- Zethus spp., synopsis, (43) 60.
- Zeugophora—
 - scutellaris in New Jersey, (41) 549.
 - spp. on cottonwood and poplars, (42) 454.
- Zeuzera spp., notes, (43) 450.
- Zinc—
 - and lead as pigments, tests, (42) 591.
 - arsenite, effect on foliage, (49) 751.
 - arsenite, notes, (48) Mass. 346.
 - arsenite, tests, (41) Wis. 661.
 - chlorid—
 - effect on strength of wood, (47) 289.
 - for wood preservation, (47) 290.
 - toxicity to wood destroying fungi, (49) 447.
 - use against weeds, (43) 42.
 - use in conservation of liquid manure, (42) 721.
 - determination, (41) 464; (46) 111.
 - determination—
 - in gelatin, (50) 712.
 - in organic materials, (42) 710.
 - new method, (43) 11.
 - use of membrane filters, (46) 614.
 - distribution in fish, (46) 566.
 - distribution in oysters, (46) 260.
 - distribution in the horse, (45) 367.
 - effect of acid soils on, (43) 27.

Zinc—Continued.

- effect on growth of *Aspergillus*, (49) 27.
- free glassware, use in zinc determination, (42) 711.
- importance in animal nutrition, (48) 63.
- in eggs, (47) 564.
- in food materials, (41) 464; (42) 758; (45) 665.
- in human brain, (46) 861.
- in human organism, (41) 465; (42) 758; (45) 64.
- in marine animals, (46) 260; (49) 258.
- in organs of animals, (47) 564.
- in oysters, (41) 464.
- in rabbits, variation during growth, (46) 667.
- in vertebrates, variation in, (45) 765.
- oxid, insecticidal value, (49) U.S.D.A. 449.
- salts, effect on bacteriological analysis of water, (49) 285.
- sulphate, effect on alkali salts, (42) Calif. S13.
- sulphate, effect on protoplasmic streaming, (45) 220.
- sulphate, use against weeds, (43) 42.
- sulphid, oxidation by microorganisms, (49) 18.
- Zinyamunga, culture in Florida, (41) Fla. 37.
- Zirconium in Hagerstown soil, (49) Pa. 210, 617.
- Zool. feeding value, (48) Can. 876.

Zoological—

- laboratory, new, in Eberswalde, paper on, (42) 152.
- meteorological studies, (50) 255.
- Zoology—
 - bibliography, (43) 250.
 - dictionary of scientific terms, (45) 299.
 - economic, (47) 254.
 - family names in, (45) S51.
 - for medical students, textbook, (46) 773.
 - generic names, "one-letter" rule, (45) 452.
 - handbook, (50) 252.
 - textbook, (48) 649.
- Zootechny, specialized, treatise, (49) 772, 782.
- Zoraptera, classification of, (43) 556.
- Zostera marina*—
 - meal, feeding value, (42) 369.
 - relation to temperature, (48) 329.
- Zukalia stuhlmanniana*, notes, (47) 547.
- Zuntz-Geppert respiration apparatus, modification, (49) 863.
- Zygadenus*—
 - spp., toxicity, (47) U.S.D.A. 181.
 - venenosus, identification, (42) 776.
- Zygobothria nidicola*—
 - parasitism by, (46) 457.
 - studies, (48) U.S.D.A. 55.
- Zygodactyly* and its inheritance, (48) 66, 469.
- Zygorhynchus* sp., notes, (48) 320.
- Zymase in pollen, (48) 728.
- Zythia phaseoli*, description, (45) 338.

